

'Data abuse will mean criminal sanctions' says Minister

by Boris Sedacca
THE Home Office has hit back at critics of the government's recently published White Paper on data protection. It has also promised criminal sanctions against those who abuse data, and indicated that most of the information held on the Police National Computer System would fall within the proposed regulations.

Speaking at a meeting of the Parliamentary Information Technology Committee, Pitcom, Home Office Minister Timothy Raison said: "We reject the Lindop view that there is a need for a multi-member Data Protection Authority, made up of a chairman and part-time appointed members.

"We prefer an individual full-time registrar appointed by the

Crown and independent of government. Suggestions that the registrar would lack effective power are misplaced," he said. "He will have real teeth."

The registrar will be able to serve notices requiring users to change their procedures to bring them into compliance with the general principles of data protection laid down in the White Paper, and will be able to strike a user off the register.

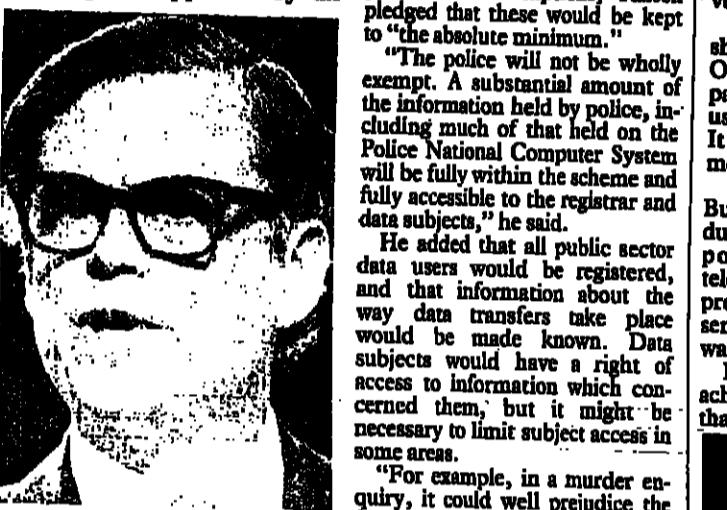
The registrar's powers would be backed by criminal sanctions against offenders, which would include unregistered operators. Raison argued that de-registration would be tantamount to putting a user out of business.

Turning to the contentious problem of exemptions, Raison pledged that these would be kept to "the absolute minimum."

"The police will not be wholly exempt. A substantial amount of the information held by police, including much of that held on the Police National Computer System will be fully within the scheme and fully accessible to the registrar and data subjects," he said.

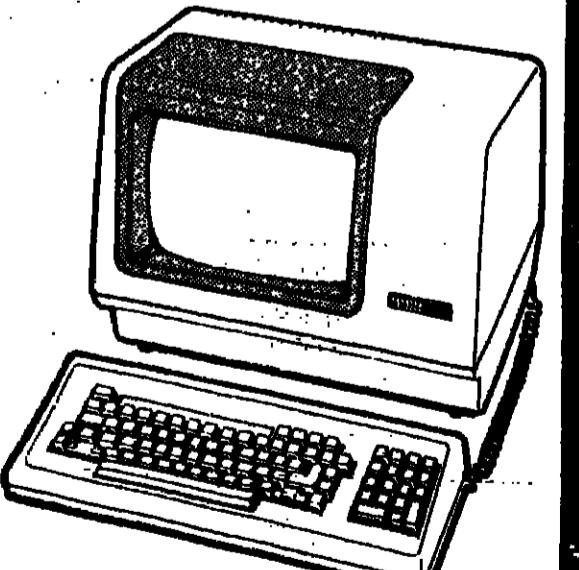
He added that all public sector data users would be registered, and that information about the way data transfers take place would be made known. Data subjects would have a right of access to information which concerned them, but it might be necessary to limit subject access in some areas.

"For example, in a murder enquiry, it could well prejudice the investigation if the suspect were to be given information held on him."



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Telesoftware for micros to the fore at Videotex 82

by Donald Kennett

EVIDENCE of Prestel's efforts to promote the publication of telesoftware for popular microcomputers was seen at last week's Videotex 82 exhibition and conference in London.

OLE of Appleby, Cumbria, showed a £135 acoustic coupler with a built-in viewdata modem which can be used by any micro with an RS232 interface to collect text and software from Prestel.

But the micro itself then has to handle the presentation of data on its own screen, which could cause problems if the format and character set are different from Prestel.

A prototype of one of the joint winners of a competition to design a telesoftware adapter for the Sinclair ZX81 was demonstrated on the IPC Viewdata stand. Marchoice, the two-man St Albans based company which designed it, is now looking for a manufacturer to take it over. Marchoice believes the device could be sold at £85 by mail order, or £90 for a version with a colour modulator.

Owl Micro-Communications showed the latest version of its Owlview hardware and software package designed to enable Apple users to access viewdata systems. It costs £395 and now includes a modem.

Speaking at the conference John Butcher - recently appointed Industry Minister with special responsibility for viewdata and teletext - said that information providers had to find a way of presenting information in a form that was useful to users.

He suggested no means of achieving this goal, but warned that services had to be made available in a user-friendly form if the potential of viewdata for interactive applications such as telebanking and teleshopping was to develop quickly.

User-friendly interaction was emphasised by Cameron, the Glasgow-based video and data terminal supplier, which showed a £300 touch-screen enhancement to its new range of 14-inch business terminals.

Mackenzie, formerly president of Northern Telecom, took over in May 1980 to revitalise the company. In 1980 it reported a trading

Change of direction at General Automation offers an upward path

by Sarah Hardcastle

A CHANGE in management direction is behind General Automation's first major product launch in four years. Returning the US manufacturer to the mainstream minicomputer arena, the Series 900 family of 16-bit minicomputers offers bit-slice technology, gate array logic chips and cache memory.

It will be upward compatible with a 32-bit machine to be introduced next year.

Announcing the series in London last week, Leonard Mackenzie, president of General Automation Inc, said: "The series is the first in our new product strategy to provide customers with a migratory path from existing systems to 32-bit machines with the minimum of re-writing." It will be targeted at GA's established marketplace: OEMs and industrial communication, process control and banking and foreign exchange users.

Mackenzie, formerly president of Northern Telecom, took over in May 1980 to revitalise the company. In 1980 it reported a trading

loss of \$16.5 million on \$125 million turnover.

With a complete new management team in all operating divisions, Mackenzie has created a new product strategy for the company, at the same time turning the deficit into \$123,000 profit on a \$125 million turnover last year.

With five models in 14 configurations, the new mini family supports GA's Control operating system and is software, I/O controller and peripheral compatible with the company's previous range, the Solution Series.

General Automation anticipates the new series will increase its competitive edge with DEC, its main rival in the UK.

The entry level system supports 64 Kbytes of memory expandable to one megabyte of memory at a single order price of £5,000.

Besides GA's proprietary operating system, Control, Bell Labs' Unix III will be available next year along with Pascal, the C language and the Pick database management system.

Deliveries of Series 900 will be within four months.

No Personal Computer plans for UK

by Boris Sedacca

IBM has confirmed that its Personal Computer will appear later rather than sooner in the UK.

An IBM spokesman said the company still had no plans to introduce it to the UK market.

US order backlog for the machine is estimated to be some 40,000.

IBM is actively discouraging the UK market for its Personal Computer, according to Suman Kumar, European product marketing manager for plug-compatible peripheral manufacturer Storage Technology.

"IBM has underestimated the effect of its name on a product. It has internal orders alone for 15,000 to 20,000 machines which it cannot fulfil.

"If you were to bring a machine from the US and to ask IBM to install it, IBM would refuse support, even though it is a simple electrical cycle conversion," he said.

The move was also prompted by the new products which Network Systems has in the pipeline.

100,000 robots

INDUSTRIAL robots shipped in Japan passed \$427 million in 1981, with over 100,000 units shipped. By 1985 the value is expected to reach \$1,000 million with exports accounting for around 8% of the total.

Sperry setback

YEAR-END results for Sperry Corporation show a drop of 28.7% in income for the fiscal year ended March 1982. Net income fell to \$222 million on revenue of \$5.571 million, compared with income of \$311 million on \$4.1 million revenue for the previous year. Revenue of the Sperry Unisys computer operation was up 5% with orders down 1% for the year, and 3% in the last quarter.

Approvals Board

THE British Approvals Board for Telecommunications, which will test devices to be attached to the telephone network against standards from the British Standards Institution, is to be incorporated as a self-financing non-profit wholly-owned subsidiary of the British Electrotechnical Approvals Board.

Subscriptions:

UK £22, Students £11, US, Canada \$33.00, Students \$16.00, Australia £19.00, Middle East, North & South Africa £19.00, Europe £22.00, North & South America £22.00, Far East, Australia & New Zealand £22, Far East, £20.00, Circulation Dept, IPC Business Press, 1600 London Road, Croydon CR9 1WE, Tel: 081 684 5916, Health, Science, Tel: 081 684 5916, Public Relations: Tel: 081 684 5916, Technical Director: Chris Hincks, Head Office: London, Tel: 081 684 5916, Published weekly on Thursdays, registered at the Post Office as a newspaper, ISSN 0010-4770, © IPC Business Press Ltd 1982.

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STORAGE TECHNOLOGY

Compec Europe provides launch-pad for 13 British firms. Kevan Pearson reports from Brussels

UK companies make push on to Continent

A MAJOR push into Continental Europe by 13 UK companies had its send off in Brussels last week at Compec Europe, sponsored by Computer Weekly.

The 13, ranging from equipment consultants to software and systems houses to microcomputer manufacturers were taking part in a joint venture backed by the Business Equipment Trade Association, Beta, and the British Overseas Trade Board.

A prominently displayed sign, "Recherchons Agent", literally "Looking for agents", was on each of the companies' stands. Many of them were at Compec Europe for the first time, using the exhibition as a way of feeling out the market for their services or products, as well as looking for potential agents and distributors.

Participation by the companies was part-financed by the BOTB, and organised by Beta.

Some of the companies, in only the second or third year of operation, would not have made the exhibition without the assistance of BOTB/Beta joint venture.

It was the second such venture since Compec took over the Brussels exhibition in 1977. The first took place in 1980, but last year there was not sufficient interest by potential exhibitors to qualify for BOTB help.

US house moves into graphics in UK

by Maggie McLennan

IN an effort to capture a larger share of the growing business graphics market, US software house Integrated Software Systems Corp has set up a UK subsidiary.

Placing emphasis on the device-independence of its software, ISSCO has announced the latest release of its three-dimensional drawing package. Called DISSPLA, its standard features include rotation, shading and polygon-fit.

According to Mel Grainger, vice-president of marketing at ISSCO, the phrase "device independent" does not only mean that the software will run on a variety of hardware.

"Device independence is the ability of the software to understand which output device is being used, and to be able to modify the form of data output accordingly - for example, to change the drawing from colour to black and white or produce size reductions automatically."

Data may be input from files, through the keyboard, or from a digitiser tablet, and output interfaces are available for a wide range of peripherals, including the Xerox laser printer, pen-plotters,

A three-dimensional drawing produced by ISSCO's DISSPLA package.

graphics display terminals and Computer Output to Microfilm (COM) systems.

Software entry price is £13,800, rising to over £25,000. With a 32-bit minicomputer, the minimum machine requirement, the system is not cheap, but Grainger feels the price is more than justified.

"Many companies have already paid a bigger price because they have a graphics department in-house. The US is supposed to be in recession, but ISSCO isn't feeling the pinch - we're trying to hire people as fast as we can get them," he said.



Micros out in force at exhibition

THERE was a strong micro flavour at Compec Europe, but most were shown by local distributors rather than the manufacturers.

The British flag was flown by Comart, Dicoll Electronics and Tansys.

County Computers, of Worcester, showed what is effectively a repackaged Apple II called Ac-

claim. It is based on a Apple II board, with an integral hard disc system, and an extensively redesigned box and keyboard.

The IBM Personal Computer was also there, but not with IBM.

Microcomputerland seems to have started a trend with its unofficial importation of IBM's micro. A Dutch company called Vollwood

Computers has now followed suit and is marketing the machine in Holland and the Benelux countries.

The Japanese presence was marked by Sord Computer Systems' European distributor Egemini, which showed most of the Sord range, except the 16-bit M416.

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MICRO NEWS

Half height floppies

TEKDATA Electronics, UK agent for Teac, will stock half height 5 1/4-inch floppy drives in production quantities from July. The two Teac products, FD-55E and FD-55F, give half and one Mbyte capacities respectively in half the space of standard floppies.

Intel modules

HARDWARE and software modules for Intel's System 86/330 are available off-the-shelf from the distribution division of MEDL in Lincoln. This system can take up to three loosely coupled intelligent boards and includes RAM and fast mass storage.

Magic order

IRISH computer and automation systems supplier Montec International of Dublin has plumped for SPL's RTL/2 for real time projects. The SPL micro development package based around the Magic language will be used exclusively for such software development, says managing director Mike Pierce.



NOYCE... SRC does not want to depend on a few sources of finance.

Multi-company co-ops in bid to cut R&D costs

THE desire to cut massive research and development costs and valuable manpower resources is proving a potent force for bringing about collaboration between US electronics and computer firms. Two multi-company ventures first proposed last year are now under way and look certain to produce results.

First off the mark is a research co-operative under the auspices of the US Semiconductor Industry Association.

First year funding for the project will be \$6 million, and it will start with 13 participating companies. The Semiconductor Research Co-operative is designed to provide contract support to US universities for long-term semiconductor research projects.

It will be a non-profit organisation and, once more companies are signed up, is expected to reach a \$25 million annual budget.

Manpower shortages and the growing cost of semiconductor R&D are the main motivations behind the venture, says Intel's Robert Noyce, chairman of the

It is hoped that support of generic research will increase facilities for more students while eliminating duplication of R&D within industry.

Funding for SRC will come from participants according to their sales or production of semiconductors, Noyce says, adding that no one company will put up more than 10% of SRC's funds.

SRC does not want to be dependent on a few sources of finance only, Noyce explains. In return for putting up money, the companies will receive licences for any patents obtained by the research organisations.

Although SRC has been set up as an answer to the US semiconductor industry's foreign competition, particularly from Japan, its charter provides for membership by non-US companies.

But the terms of such membership, which demand that all other SRC members have equal rights to participate in similar co-operative programmes in the other countries, are thought unlikely to bring many takers.

Executive director of the co-operative is to be Larry Stump, previously director of the US government's very high speed integrated circuit (VHSIC) programme. Companies taking part include large producers and design houses IBM, DEC, Honeywell, Mita, Intel, NatSemi and Burroughs.

The topics the co-operative is looking at to develop a range research strategy include packaging alternatives for VLSI lithographic systems; semiconductor materials; chip reliability; CAD techniques. In the short term it will be looking at costs and effects of IC defects and prospects for gallium arsenide.

While the SRC is getting a second venture, Control Data Microelectronics and Computer Technology Enterprise (MCET) has to establish its financial and organisational structure. The forces made up of representatives of the 15 companies which attended last month's meeting have been set up to formulate development proposals.

It is expected to have "some influence" over what is produced.

Anglicising American software, however, is only one side of the coin: variations in distribution rights also play a large part in making UK-produced software look attractive.

Problems in acquiring rights in the US do not exist over here, according to Patrick Shannon of Softmatic Corp, a software distributor based in Massachusetts which is shopping in the UK for IBM-compatible products, with an initial budget of £100,000.

"In the States it is almost impossible to get exclusive rights to anything, because of the differing laws in each state," he said. "The beauty of British software is that you can buy it outright."

In recent months another trend has appeared: that of buying software companies outright to obtain exclusive rights to their products, and with the spin-off that they will continue to write software that the US parent can market in Europe.

The recent acquisition of CSA Microsystems of Gerrards Cross by software distributor Peachtree, now owned by Management Sciences America, is a prime example. CSA Microsystems' "downy" was a complete range of accounting packages written in CIS Cobol, which Peachtree wanted both to complement its own MBasic programs and as an entry into a wider commercial market.

Although Peachtree denies that

CSA Microsystems will now be writing software to order, managing director John Hales said that

problems are much greater.

"We are looking for any kind of software that is unique and exportable," explained George Tate, president of Ashton-Tate. "The best overall software products are now coming from Japan, Germany and France, but the language problems are much greater."

According to Tate, the company is covering all its options by also looking for partners to assist in solving language problems, rather like the method adopted by TOM.

He is also keeping his options open on the channels of contact.

SOFTWARE FILE

US firms seek British products for takeover

NOT content with exporting its native software, the US is looking to the British market to find packages for European distribution, or for sale in the UK.

Differences in accounting and language between European countries and the US mean major amendments to software, often involving information which is difficult to obtain outside the country concerned. Some American companies such as The Office Manager (TOM) which provides software for Wang machines, tackle the problem by appointing distributors in the countries, making them responsible for conversion of the US product and for the subsequent maintenance.

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IT IS intent on winning over the DPM

I. P. Sharp is intent on winning over the DPM

AFTER years of skirmishing, it looks as if the hatchet may soon be buried by DP departments and APL suppliers, according to Fred Perkins, director of European operations for I. P. Sharp Associates.

Perkins claims that I. P. Sharp is now talking to the DPM, rather than the erstwhile end-user. The company is intent on breaking through development restrictions traditionally imposed by the DPM department.

"I. P. Sharp started off with very little in the way of packages, but started writing in APL to allow customers to change systems as they went along."

Many large clients of I. P. Sharp's time sharing service have now gone in-house, including Rank Xerox, Citibank, Andraitx and the Wellcome Foundation. Philips has also taken APL in-house in the first of several installations, in which APL users will be provided with a bridge into an IMS database.

Micro APL is another pie in the sky which I. P. Sharp has a finger firmly planted, but Perkins does not altogether approve, commenting, "APL is very powerful, and not really something to be implemented on a 10 cent piece of hardware."



PERKINS... "Deep down a lot of DPMs want no users at all."

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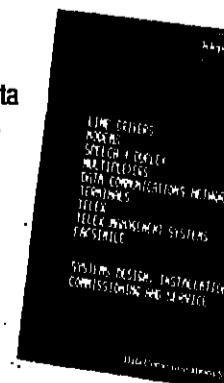
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Apple Pi for industry

FOR those wanting to use the familiar Apple II personal computer in harsh industrial research and factory environments, a repackaged version is available from Newbury-based MC Computers.

Called Apple Pi, the system is made up of a repackaged Apple and floppy disc unit in a sealed metal enclosure to keep the machine out of the way of dirt, electrical noise and vibration.

User-definable push buttons are provided on the standard version

of Apple Pi which can reduce operator intervention in the running of the machine to a degree pre-programmed by the user. The computer and disc unit, with its automatic boot-up facility, are kept out of harm's way.

Advantages claimed by MC Computers for the machine include the ability to develop applications on a normal Apple II in the laboratory, then transfer them directly to the machine in the process room or on the shop floor.

One of the main selling points is that it is universal, and it is possible to index items under any

in-demand if a general purpose materialised.

Ford currently uses many standard ICs and custom circuits designed by outside semiconductor manufacturers. The need for custom chips is growing. This, along with greater availability of "silicon foundry" fabrication (manufacturing chips from customer's designs) in companies such as Motec, United Electronics and National Semiconductors, and National's developments of computer-aided design tools, has made it possible for Ford to get left short of supplies at a time when IC designers and support personnel are

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Where would we be without life's routines?

WHEN we look for a methodology for systems analysis and design, work — a procedural plan is what we mean but it seems that that doesn't sound grand enough — what are we expecting it will bring us as benefits? My own list of expectations includes the following:

- A — A more consistent performance by the analyst from one task occasion to the next
- B — A more standardised form of design and all the advantages that should follow from this
- C — A better understanding of how the problem has been tackled by being able to trace the analysis and design thought processes of the project team

I know of other claimed benefits, but these three will suffice to remind us that we are talking here about the need for management control. It is hoped to achieve good results without suppressing the kind of personal qualities — skill, intelligence, imagination, craft-knowledge — that might be thought to work better when the analyst is more free of day-to-day control.

With this last point in mind in particular let's take a look at the darker side of the three hoped-for benefits.

"Consistency of performance" in practice means the lowest common denominator and encourages mediocrity, thus reducing the chances of finding more creative solutions to problems.

"Standard forms" conceals bureaucratic overheads, documentation to be maintained, extra staffing, more specialisation, and so on.

C is a fallacy since as all who have used a methodology will

know one has in practice to pretend one has worked a certain way so as to be obeying the "rules" and so then the outcome does not reveal the real thought processes of the designer at all.

I have either experienced these negative reactions myself or have heard them expressed directly by other practitioners. It is the age-old argument about routine being the enemy of man's spirit, or something of that kind. But when it comes down to an individual and his job there are very few who could honestly admit to welcoming a life of no routine at all.

The basic meaning of organisation is that it comprises members who agree to adopt common

6 Much relies upon the actors being willing participants. Not only willing, but believing participants also

procedures of action (many to be used repetitively).

If you try to raise the question of psychological health in this connection — the "assembly-line worker" syndrome — you may find you are not on very safe ground. A recent radio broadcast enabled Dr Donald Broadbent of the Department of Experimental Psychology to make the point that according to quite respectable research short tasks repeated frequently seem to be no more damaging to psychiatric health than longer tasks repeated less often.



Alwyn Jones is senior tutor in business systems analysis at City University London, and acts as a consultant in the public and private sector.

Ensuring power for the people

WE like to think of data as whatever it is that was recorded to show what an "event" has happened. The event may be that an individual's employment has terminated or he has worked 40 hours this week. In this concept it becomes possible to separate from whatever is recorded what we call indicative data apart from the actual data itself.

The indicative data shows what the actual data is and, for our payroll example, which employee it applies to. We can call the balance of what is recorded actual data for want of a better name.

For the termination example the leaving data is implied by the indicative data and therefore not strictly speaking necessary. That brings us to the turnaround document and the theme of this column. The computer can produce a document on which the human may record the data when it occurs in his or her brain. The computer prints out the predictable indicative part while the human supplies the actual data when it occurs. A tick in a box will often suffice and be a lot more accurate as a result.

Now data firstly occurs in the real world outside of any computer. We have been inclined to the view that all data occurs in the human brain, but that requires some other word to be found for the signals in a computerised control loop.

Today humans have to initiate the recording process and on first occurrence the method used is still mostly pencil and paper. Not quite the forefront of information technology the computer is supposed to be.

The same principle can be followed even if no written record exists prior to computer entry although we have doubts about the audibility of such a system.

Going back to what we call data, it will be realised that the indicative data is much more predictable than the actual data. For one thing the indicative data has to be acceptable to the validations of the computer system. As far as the

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FOCUS

Writing on the DP walls



Cliff Dillaway is an independent consultant specialising in accounting software, taxation and payroll.

DP managers by now should be resigned to being beaten down and very much out. "Traditional DPMs restrict effective use of computers", "DP managers regard as a handicap", "the role of the DPM is over", "DPM declared dead" are typical comment being expressed both inside and outside the computer industry.

Although DPMs have had the time to study the writing on the installation walls, few have heeded the warnings, preferring to hope that the business men, local area networks, videotex technology and the company we director will go away.

Unfortunately for the DPMs such hopes come bundled in a wishful thinking package. It from disappearing like a young salesman one minute after a contract has been signed, to micro, along with office automation, robots and information technology, seems here to stay. After distributed processing developments, the DPM team will be distributed into the local recruitment agency.

At least the DPM manager can complain that he was not wanted. As long ago as January 1981 George Penney of the NCC was writing in Computer Weekly that only programmers and system analysts, plus some operations personnel, could expect to remain unscathed by the coming control loop.

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BOOKS

The protection debate is given a wider context

The Politics of Secrecy. James Michael. Penguin Books. £2.50.

THIS book is about the attitude of successive British governments to information, its use and dissemination. It deals on one hand with the government's refusal to allow freedom of information, or access to government information, and with the lack of privacy or data protection legislation, on the other.

It gives a thorough and extensive coverage of the issues underlying the whole secrecy debate - the right to know - and is essential reading for anyone interested in this significant debate.

Its one deficiency is that it only devotes one chapter to data protection and computers. This gives a fairly thorough treatment to the Lindop Committee report on privacy, but does not mention subsequent work in this area, like the Council of Europe convention on data protection, of which the UK is one of the signatories.

It does discuss the Police National Computer, though even

this has been overshadowed by a Scottish research group's report on The Police Use of Computers, published at the end of March.

The debate about data protection has tended to be conducted in isolation and this book performs the useful function of putting the whole thing into the context of the much wider debate of open government.

Successive British governments have, it seems, a fatal addiction to secrecy, to the ludicrous extent of refusing to disclose information about the safety aspects of British products, even when this information is publicly available in the United States, because of the US Freedom of Information Act.

The book amply covers the machinery through which the government maintains its monopoly of information; the layer upon layer of informal rules and Acts of Parliament, topped by the Official Secrets Act. Most alarming is the arbitrary and inconsistent way in which this Act has been applied.

From the discussion, it would

wants to remain independent from any single manufacturer, his quest for common ground may lead him away from in-depth coverage and to a compromise coverage of the lowest common denominator in operating systems.

Operating Systems Elements - a User Perspective. Peter Calingaert. Prentice-Hall. £17.95.

THE complexities of operating systems make them a difficult subject to write about. If an author wants to give practical and in-depth coverage to the subject, he will be tempted to concentrate on one manufacturer's approach and to look at that manufacturer's operating system evolutionary path.

The problem here is that only the large manufacturers such as IBM, ICL or Digital Equipment get coverage if the book is to find a large enough readership, although lesser-known operating systems may be more elegant.

If, on the other hand, the author

wants to remain independent from any single manufacturer, his quest for common ground may lead him away from in-depth coverage and to a compromise coverage of the lowest common denominator in operating systems.

"The book makes a single pass over operating systems, at a level intended to be neither trivial nor deep. Principles take priority over engineering details, and complete implementations are not discussed. A few algorithms are expressed in a bastard Pascal that should not be one able to read Pascal, PL/I, or Algol programs."

It is intended for people studying the control programs of an operating system, of whom relatively few will ultimately design and implement an operating system. Only a somewhat larger

number will modify a control program, but virtually all will use the facilities provided by operating systems, says the author.

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Philip Rule

Chairman of software house Software Computing.

Buyer's guide leaves out Sinclair

The Home Computer Handbook. Frank Herbert with Max Barnard. Victor Gollancz Ltd. Price £7.95.

IT is doubtful whether this book is of much value. It contains many assertions on the motivation of computer professionals on such matters as artificial intelligence and many other areas which

demonstrate that the author's knowledge of the subject is at best superficial.

It is also unlikely that many people, without access to a computer, will learn programming from a book using an artificial language.

It is about as likely as someone who has never seen a piano and has no access to one, learning to play

from a poorly written book.

The book claims to contain a buyer's guide to personal computers but does not mention Sinclair. It would seem to have got it wrong.

Philip Rule

Chairman of software house Software Computing.

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Mail service planner contains some pearls

Planning for Electronic Mail. Compiled and edited by Alan Simpson. Gower Publishing Company. Price £9.50.

READING this book will give a strange sensation of déjà vu to anyone who has read *Planning for the Electronic Office*, the first of the *Office of the Future* series. Although the contributing authors are different, much of the text seems the same and a spurious section on the history of word processing has even been allowed to sneak in, under the justification that it is "a likely contender for generating the mail".

An optimistic section on the future of Prestel, by Graham McMorris, was presumably written before British Telecom announced 90% price cuts in its desperation to get the system more widely used. His cheerful catalogue of the improvements scheduled for Prestel left me with a sinking feeling: does this mean that British Telecom's charges will have to rise yet again to pay for it?

The advantages and disadvantages of facsimile machines are another area amply covered within the book, and A. St. F. X. Gerard of ITT Business Systems gives a useful cost comparison chart that is sure to bear him out.

Detailed advice on the planning

side is given in the first chapter by

Alan Thompson of IFCP Consult

ing, with yardsticks to help evaluate the benefits of introducing this type of system. He suggests that the entire cycle of mail processing, and therefore current deadlines, within the office environment would be altered by electronic mail; something which many users might only discover the hard way.

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Basic principles of microprogramming

Elements of Microprogramming. D. K. Banerji and J. Raymond. Prentice-Hall, 1982. £18.75.

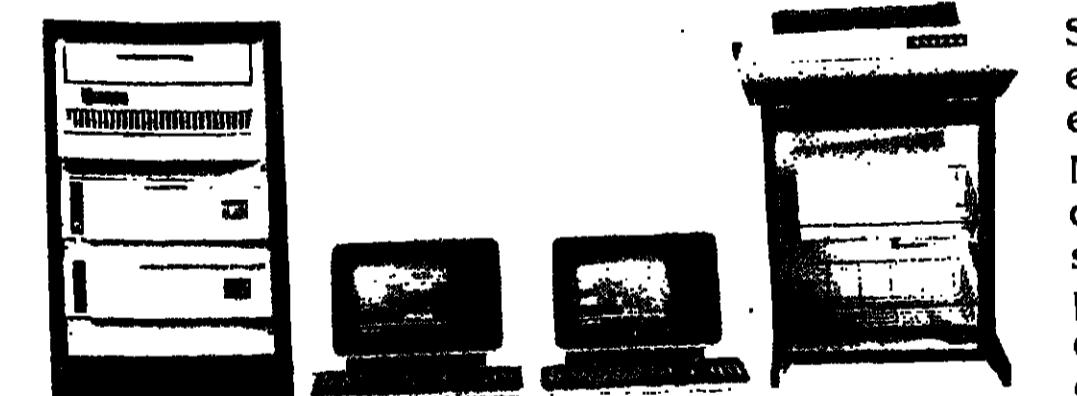
INTENDED to provide a comprehensive coverage of basic principles, practices and applications of microprogramming, this book adequately fulfills its aim. It derives from a course on microprogramming and machine architecture but should be of interest to a wider audience, although as the authors rightly point out, microprogramming should not be confused with the programming of microprocessors.

Readers are assumed to have a background knowledge of machine organisation and assembly language programming. With this base the first of the five parts of the book covers basic, historical evolution and essential computer organisation in three chapters, thus providing a valuable introduction to the field and a sound foundation for the book as a whole.

Tony Price

Head of Computing and Mathematical Sciences, Wolverhampton Polytechnic

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Sequential Control Logic, represents standards of efficiency and value for money we believe you'll find extremely hard to beat.

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The POINT 4 is also available with a wide range of software products. The multi-tasking, time sharing systems, IRIS and BLIS, support simultaneous system use for data entry and retrieval, as well as programme preparation, debugging and execution. The system is designed for maximum flexibility in configuring system peripherals and supports ASSEMBLER, COBOL and BASIC Languages, a variety of utilities and an automatic programming system.

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Find out more. Contact the sole UK distributor,

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Industry training board names head

THE Engineering Industry Training Board, responsible for training in the computer manufacturing industry, has appointed Ronald Stevenson as director to replace Joe Moon. Moon retired last year because of ill-health. Stevenson has been on the board since 1965, and head of corporate planning since 1976. He is a chartered engineer and a Fellow of the Institute of Mechanical Engineers.



DP squash tournament

SQUASH fans are being given an opportunity to show off their skills and win a share of the £1,000 prize money offered by Carter-Parratt in the 1983 Wright Line Squash Tournament. The winning company will also be presented with £500 voucher for the computer documentation filing system Document Mate from the Wright Line range.

Entry is limited to 512 teams, and early rounds will be drawn on a regional basis to minimise travelling. One team per company per location will be accepted. Rounds will be played throughout the year culminating in the semi-finals and

finals at the Lamb's Club in London on December 3 and 4, 1983.

First round starts in January, but Carter-Parratt advises competitors to apply as soon as possible.

Entry forms and details from 1983 Wright Line Squash Tournament, SP&M Ltd, Penthouse Suite, Turriff Building, Great West Road, Brentford, Middx.

■ Diane Williams has been appointed UK sales manager for Tempo response time monitor at PME. She was previously with Rank Xerox.

■ Michael Coffee has been appointed UK sales manager for Tempo response time monitor at PME. He was previously with Rank Xerox.

■ George Pitcher has joined Oceanic as manager of the commercial system division. He was previously business manager, power/process control.

■ Fred Klerks and Mike Lacey have joined Eosys as senior consultants to work on the CCTA telecommunications strategy study and the DoI/British Telecom Joint Research Programme. Klerks was previously with Citibank and Lacey was previously with CAP.

■ Dr Douglas McGregor, formerly reader in the department of computer science at the University of Strathclyde, has been appointed personal professor at the department. Dr Andrew McGinty, a lecturer at the university, has been appointed reader.

■ Ted Barker and Rodney Drew have been appointed to the board of ICFC Consultants. They are both managing consultants.

■ Hugh Morris has joined Kennedy as sales engineer. He has been with the company since 1979 as service and training manager.

■ Ken Trueman has been appointed director at RTZ Computer Services. He joined the company five years ago as salesman for the Fascia system, becoming product manager, then sales manager for Fascia and GL Plus. He was previously with Baric and ACT.

■ Jeff Parkinon, formerly a project manager, has been promoted to product manager for Azurdata terminals at TRW Datacom. He will be based in Los Angeles. Hugh Roberts joins the company as NBI manager for Europe, Middle East and Africa.

■ Michael Coffee has been appointed director, industry marketing at Modcomp. He was previously business manager, power/process control.

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Four new directors at SPH

FOLLOWING the re-organisation at SPL, Systems Programming Holding, the holding company, has made four new board appointments from Western Broadcasting Company, holder of 60% of SPL. They are Frank A. Griffiths, chairman of Western Broadcasting, Frank W. Griffiths, Ray Peters and David Owen, all directors of Western Broadcasting.

Acting chairman is Robi Gil, who is chairman of Standard Industrial Trust. Managing director is Peter Adams, former chairman and MD who remains chairman and managing director of SPL.

David Redway becomes director responsible for UK operations and Michael Wale continues as secretary and financial director.

The British Technology Group, which owns a 40% interest in SPH, has not yet nominated its representatives to the board.

SOFTWARE MONTH

Financial and project planning

IN the welter of off-beat applications now coming on to the market, it is easy to overlook the basics. Yet financial software — accounting, general ledgers and the like — still accounts for a huge part of software revenue and spending, in a market which is becoming fiercely competitive.

David Redway becomes director responsible for UK operations and Michael Wale continues as secretary and financial director.

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Support and maintenance are still key issues, which is why bureau services like RTZ Computer Services, RHM, and many others, keep in the running. Often those who urge that their product is more expensive because it is well supported will win over the cheap solutions, simply because a firm's data on its transactions is its lifeblood, and not many people are willing to invest in a computer without taking a long hard look at the quality of software to go with it.

With the microcomputer's emergence as an increasingly competent business tool, a race has begun to put certain well-established and proven applications on different machines. The pattern already set in the earlier eight-bit market of "approved suppliers" is being enthusiastically followed by the vendors of 16-bit "personal" computers.

As ICL, IBM, NEC and others all opt for the same software vendors, the various microcomputers are looking more alike — except perhaps for the price. "User friendliness" is a feature they have in common, allowing end-users to get their hands on their own data.

Once that has happened, the possibilities do not stop with the selling of everyday financial applications. Once the data is there it can be put to other uses — modelling and planning being the two which are already tipped to become the big software-revenue spinners of the Eighties.

So Software Month goes beyond the basics, with a look at the financial modelling and planning software which, even if it initially appears expensive, may save companies thousands of pounds in the long run.



Companies like CAP were founded by accountants who realised early the huge market for financial applications.

This is still the main problem facing financial software manufacturers. It has to be supported as well as being reliable in the first place, since once a company has abandoned its book-keeping by hand in favour of machine-held data, it is at the mercy of the computer and its software.

Many accountants were absorbed into the microcomputer world, which has expanded the marketplace for software, and in particular financial software. Companies like PPL, MSA and its recently purchased micro arm, Peachtree, already flourish on the strength of

A MANAGING director in the 1980s needs to be perched on the top of a hill, feet on a skateboard and with a universal joint in his neck so that he can see in every direction and react quickly. That comment from a supplier of financial systems sums up the motivation for computer-based planning systems at a time when the need to predict the future is as vital as understanding the past.

The problem for most companies is how to transform crystal ball predictions into factual reality.

Projecting into the future is a risky business at the best of times, so how do you reduce the odds and produce plans which will not lead your company into ruin?

The computer, which has infiltrated most aspects of a company's operations, is being increasingly pushed forward as a universal planning tool. The problem for managing directors and even company accountants is that without the time or even the knowledge to examine every system on the market, which computer route should they take?

For this reason several suppliers

to be able to do their own thing and therefore need their own financial planning facilities."

But what exactly are companies

looking to achieve from their planning systems? According to Sutcliffe of EPS, the current economic climate is making short-term control a higher priority than long-term planning. Such areas as project and acquisition appraisal and management reporting are the key issues affecting many companies.

Intelligence UK has sold 2,000

Micromodeller systems in a year

and according to the company's

sales director John Butler, at a

total cost of £3,500 for a working

system, people are prepared to

have a go. It is this move to micro-based systems which has brought

planning into the financial reaches

of most companies and has opened

the door to a large number of

smaller decision-makers who want

to use it.

According to PPM's commercial

director David Tomkins: "We felt

there was a need for financial

planning packages at the mainframe

level based on microcomputers.

We looked around at what other

packages had at that time and tried

to concentrate on what we felt

users needed for a practical

approach to modelling."

Sales director John Butler be-

lieves one of the key aspects to

Micromodeller's success is that it

is not menu driven.

Users have an

English-type language which they

use to tailor models to their precise

needs.

As the system works purely

on a numbers basis, it can be used

in areas such as marketing, stock

control and production, as well as

financial planning.

The system has two other ad-

vantages over many stand-alone

micro-based planning systems.

Firstly, an interface is available

which means it is possible to link

Micromodeller into other compa-

nies.

It is this personal planning ap-

proach which is an important part

of the success of micro-based

systems.

Finplan claims that Finplan

can be used for a wide range

of financial and corporate planning

functions ranging from budget

and cash flow forecasts to consolidations

and provides similar facilities

to those currently available from mainframe-based systems.

Finplan can also link into other

financial packages which run on

the ACT 800, although Tomkins

says that the majority of systems

are used on stand-alone basis.

It has stimulated the planning ap-

proach which is an important part

of the success of micro-based

systems.

Finplan has also stimulated the planning ap-

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SOFTWARE MONTH

AI leads in the next computer age? Don't hold your breath!



Ferris is a consultant in the UK and US providing marketing and planning advice to computer vendors, particularly in the area of software.

access to very specialised non-AI software which might have AI technology incorporated in the user.

And then we come to the Japanese, who are making a lot of inextricable noises. They are busily showing off impressive block diagrams for a future "fifth generation" AI machine. These have little boxes labelled with terms like "knowledge base", "problem solving machine", "access using natural language, speech, picture, etc.", "inference system".

All very AI-ish and impressive, until you realise that the Japanese don't know much about AI and that these diagrams have more to do with very speculative hopes than any tangible development plans.

Important and valuable work is going on in the AI labs, but commercial products are unlikely to proliferate until the end of the decade.

David Ferris

with AI other than in its marketeers' minds. (In fact, there are a number of such AI false pretenders.)

So for the moment, there is not much available by way of AI products. Does the immediate future look any better?

Again, don't hold your breath. There is a lot of talk and very little action.

Teknowledge has ideas for program development products, but no concrete plans. A company called Cognitive Systems, based in New Haven, Connecticut, has optimistic plans for several natural language systems for business users, but development is still at a very early stage.

Down in Texas a new startup is planning to develop an Ada teaching machine which may use AI technology; and in Palo Alto, Intelligenetics is selling time sharing complex tasks.

Right now, AI is gradually moving from the research labs to the corporate world. Notably, a number of large companies are building extremely specialised expert systems, for in-house use only.

Much of the recent excitement has centred on these developments.

Unfortunately, the commentators often overlook that such projects are highly turnkey in nature, serving the specialised needs of a particular organisation, and are unlikely to result in products suitable for general sale to end users, DP managers, OEMs or the like.

So what real AI products are out there? When you count them up, very few indeed. Probably only two clear-cut candidates, in fact.

Artificial Intelligence Corp, of Waltham, Massachusetts, has a very nice natural language query system called Intellect. Using this, you can sit down at a CRT and type in questions in ordinary English (as opposed to a structured English-like language) about your corporate database, which Intellect then answers. Currently there are about 60 installations, so Intellect is certainly a commercial success.

The other unambiguous AI products come from Machine Intelli-

"FOR the first time, so-called expert systems can take the place of human experts in any field." Exaggerated and incorrect statements such as these, from a recent issue of *Business Week*, are turning artificial intelligence into a hot topic.

In fact, *Business Week*, normally august and conservative, used its front cover to announce ARTIFICIAL INTELLIGENCE — THE SECOND COMPUTER AGE BEGINS. And *Datamation*, highly regarded in DP circles, runs such provocative headlines as AI Comes of Age and AI — Key to the (Japanese) Fifth Generation.

All this makes for exciting stories, but to my mind, everyone's getting carried away. AI does have very valuable things to offer, but as far as commercial products are concerned, almost nothing is available now, and precious little indeed is in the works.

This week I shall try to show that the public's appetite for being prematurely whetted — the fruits of AI are unlikely to be ripe for several years yet.

The first thing you should know about AI is that whenever an AI expert gives you a neat definition of what his field is, take what he says with an immense grain of salt. So far, the experts have not quite been able to agree about what they do.

The facts are that AI researchers are clever people trying to do a number of clever, difficult, and interesting things with computers. They try to, though not always, make computers do things human beings can; quite often, though not always, they fail in their endeavours.

Equally, however, AI researchers have had their share of spectacular successes, any of which would astonish your average Cobol programmer.

Today's AI community is fairly small, largely restricted to a handful of universities such as Stanford, MIT, Carnegie Mellon and Edinburgh, and the research labs of a few major corporations such as Xerox, Fairchild and Hewlett-Packard.

Some major areas of AI interest are as follows:

Expert systems. Programs which can be taught about a very narrow area of expertise such as oil prospecting or disease diagnosis, and which can provide expert advice on the issues concerned.

Natural language understanding.

Developing programs which understand ordinary typed English,

rather than just "English-like" languages.

Intelligent robotics: Commander Bill of Warwick University negotiates a flight of steps.

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Intelligent robotics: Commander Bill of Warwick University negotiates a flight of steps.

ROUND UP

FOLLOWING ICL's lead, Hewlett-Packard and Digital Equipment both announced schemes to assist third-party software suppliers.

Hewlett-Packard is launching a marketing programme called HP Plus, which offers incentives such as discounts on equipment on top of marketing assistance, while

Digital is to set up a directory of

Digital Classified Software.

A microcomputer package claimed to offer the facilities of a standard CAD system for under £10,000 was launched by KGB Micros of Slough. Developed by

project management specialists

Micro-Designers, Micro-Designer accepts input from the keyboard, ploter feedback via a digitiser pad and offers symbol rotation, repetition and shading as standard.

Microcomputer database system

MDBS II is to become widely available in the UK following a joint

between US software vendor International Software Enterprises and UK consultancy Pactel. The joint venture, ISE-Pactel, is aiming to

tempt large users in multination

corporations with the latest imple

mentation of MDBS II, for be

tween £2,000 and £5,000.

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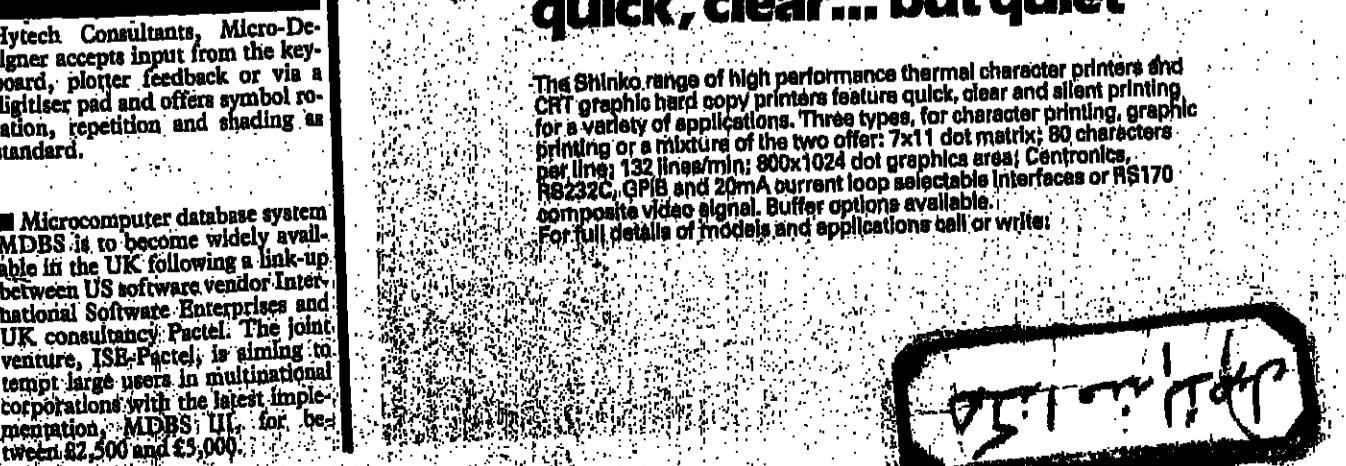
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SOFTWARE MONTH

IS IT too late for decent ledgers in the computer industry? This is a question that many first-time users and suppliers are asking as an increasing amount of software fails to keep the promises made in the glossy brochures.

Because of the slowness in developing financial applications in-house, many users have bought personal computers out of their departmental budgets — sometimes with disastrous results.

But mainframe-oriented suppliers are fighting back, spurred on by the falling price of hardware and selling applications into the 16 and 32-bit microcomputer market.

This has two advantages for users. One, they cash in on a wealth of existing software expertise and, two, they get faster and more efficient systems which can also talk to their organisations' main databases.

"MSA addresses two main markets — the established mainframe user and new users," says MSA's managing director Michael Hunt.

"Traditional batch computers have got to a breaking point — do they develop applications in-house or buy in? As hardware costs are coming down, we are jumping into the 432 market earlier and they want packages."

"Today everyone wants online

Mainframe suppliers fight for accounting packages market

Disappointed users are wondering if good ledgers exist, says Chris Youett

and database applications. All our development work is oriented to making software more user-friendly."

He adds: "I expect to see a lot more online products and the company sees an integration of micros and mainframes. We must have software that is compatible to the central database. Modelling tools that can be used on a micro will make packages a lot more user-friendly."

ICL distributor Systemsolve has recently signed the Trader Point agreement to market the ME29 super mini. Director Peter Wemyss sees the kit as "irrelevant up to a point. Selecting ledger systems depends on where the user wants to enter the DP market."

"It is important to pick the type of ledger to suit the user's requirements and then pick the hardware to run it on. It is important they don't go to the manufacturer."

Price Waterhouse Group, was set up by Geoff Knight after a Honeywell user asked him to find a suitable ledger system.

"We couldn't find one," says Knight, "so we wrote our own. There was a need for software that matched UK and Continental accounting practices and could handle multi-currency and multilingual transactions. It is a British pack written by British accountants."

At mainframe level, there is Knight Consultancy Services, based at Croydon. Its software is written in APL Cobol and will run on IBM systems using the 360 instruction set, Univac, Honeywell, Hewlett-Packard, Wang, Burroughs, DEC VAX, Data General and ICL kit.

Knight, which is part of the

among data processing managers about what they consider the encroachment of micros within their organisations and the subsequent duplication of effort and facilities.

"Ideally, you should go to an independent supplier and try for a user-driven system," he adds.

Some accounting practices have gone into the ledgers market, largely because they could not find software good enough for their clients' applications.

"There is a growing market for standalone machines which can talk to mainframes. It is not as simple as people make out. Operating systems, for example, are still not sophisticated enough for a good ledger system," he adds.

There is also growing concern

Canadian European Systems of Blackrock, Dublin has brought out a package which it claims were clients' requests for a low-cost alternative to micro-based planning packages.

Called DAIN 3000, DAIN II and DAIN 32, they are menu-driven modelling and reporting systems designed for use by financial and planning applications.

DAIN 3000 operates on HP 3000 kit under the MPE operating system, DAIN II works on DEC PDP-11 kit under RSTS-E while DAIN 32 operates on VAX kit under the VMS operating system.

The packages cost about £1,300 a copy and incorporate over 200 routines for data manipulation, reporting and file handling.

'95% of micro ledgers made by cowboys'

MANY users are now getting their first taste of computer power on a micro — and are finding it often turns out to be a sour experience.

Poor software, non-existent documentation, limited after-sales service and a slow turn-round are common complaints.

Phil Kellingley of Surrey-based Micro Computer Business says, "95% of the ledgers currently available were created by part-time programmers on ZX81s in their back bedrooms."

"Their complexity is non-existent and the packages are limited. One of the first things a user puts on his system are the ledgers. It is not simple packages," he adds.

The real problem is that it is very easy for cowboys to operate from home. It is a bit frightening. Some of the ledgers on the market haven't even been debugged after two years."

Kellingley advises users to make sure the package will run their individual systems in terms of data volumes, speed of operation and the size of account number.

"Take your accountant or independent consultant along with you," he says. "It is worth laying out £300 for the advice. The buyer must beware. The smaller the machine, the more likely you are to be ripped off."

Independent consultant Bill Guy of Guy Associates in Coventry says his company has never been associated with a package which hasn't had some problem or needed tailoring. "For example, few invoicing packages have quantity fields that have decimal places," he says.

"If you deal in items sold by the length, it is quite likely you will send out, say, 2.5 metres of tube. I was recently examining a pack which could not cater for a non-stock item.

"But Mercury allows users to tailor or write their applications in far less time. I estimate the listing for a standard 20K financial package is 10 to 20 pages."

"On Mercury, the listing is reduced to 10% of the original. It rather turns the whole software market on its head. Mercury has the power to join up to 15 Apples with the 16th controlling a disc, thus giving true distributed processing — and this is the machine that was made to play space invaders on."

"The product is only saleable to programmers and not to the end user so it won't cause any redundancies. Mercury requires the programmer to be a bit of an analyst.

"It uses masks like CP/M and the catalogue sorts the data alphabetically whether it is a file, program or mask. If I want to type in the date, check it, display it and modify it with 20 fields, my program consists of LET 'I', 99' Pollock adds.

"We used the US Osborne software as a basis for our own packages and tested it on our own clients. We took on programmers and have now got some decent

Small computer users are often conned into buying sub-standard software Chris Youett passes on some tips



POLLOCK . . . Financial applications always need tailoring.

THERE ARE THREE THINGS THAT MOST D.P. MANAGERS COULD DO WITHOUT

With the continuing growth of computer applications in business and industry, the role of the Data Processing manager has become more important and challenging than ever before.

However, there are three areas that most D.P. managers would agree are, in plain language, a pain in the neck.

Payroll, personnel and pension administration.

They are complex, time consuming, and frustrating. The requirements are forever changing, the results always required yesterday.

Some micro users have become so disillusioned with the standard of ledgers that they have written their own, and put them on the market.

One example is Business Solutions of Ilford, Essex which is an offshoot of an accounting practice. Director Stephen Page explains: "We would send a client's work to a bureau and it would come back a week late and with full of holes. We looked at the various micros and packages — most of which were rubbish."

"We used the US Osborne software as a basis for our own packages and tested it on our own clients. We took on programmers and have now got some decent

through nearly twenty years of experience. All three systems are based upon a simple concept.

The central function and basic requirements of manpower administration systems are the same for any company. The complexities arise through the variety of input calculation and output requirements, and their frequently changing nature.

Peterborough Software developed their systems based upon central, common, programs. These then become backed up by a comprehensive support programme, including user education and statutory maintenance.

To get the full Peterborough Software story, telephone Peter King on 0733 41010, or write to him at Peterborough Software, Borough House, Newark Road, Peterborough PE1 5YJ.

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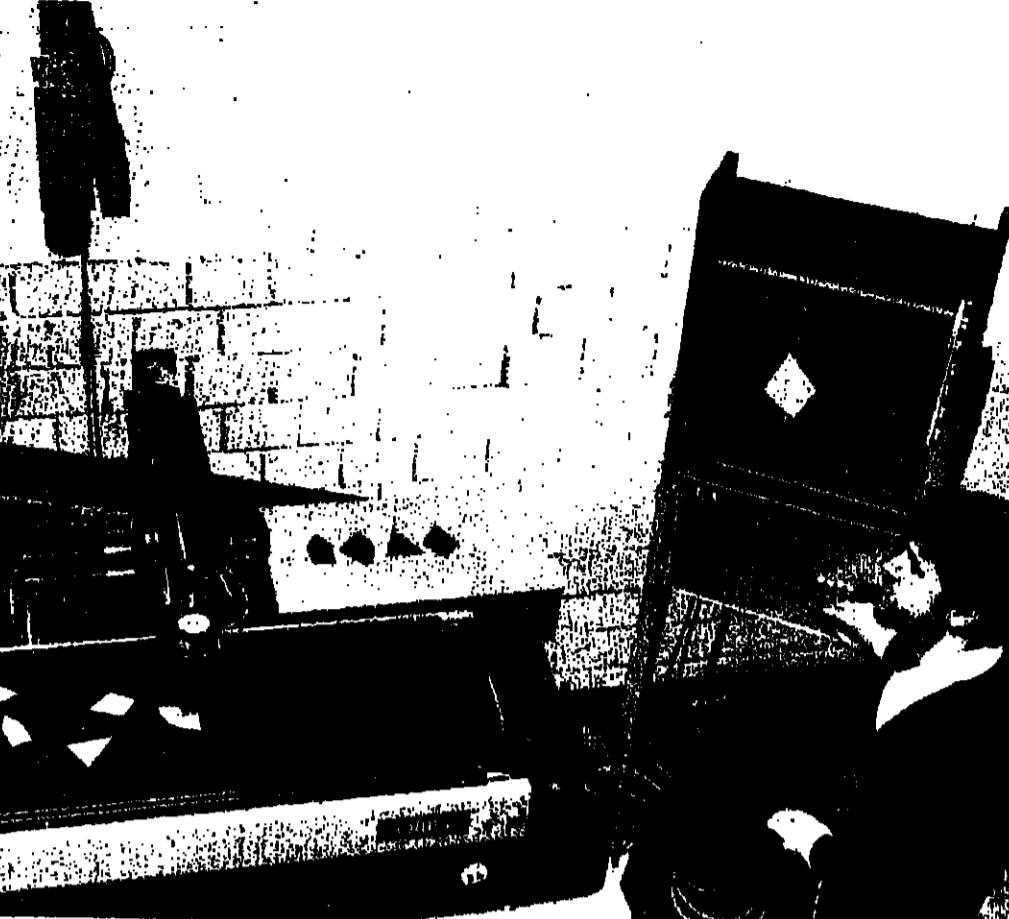


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A user may soon tell a robot to carry out a task without having to describe how to do it... Phil Manchester reports



The real breakthrough will come when robots can take sense data, such as vision, into consideration.

Programming the robot to solve its own assembly problems

EARLIER this year, the Science and Engineering Research Council announced its sponsorship for a working party to examine the requirements for a programming language for assembly robots.

The SERC initiative is, perhaps, a reflection of what is a minor revolution in the robotics research community - the transition from what might be called sophisticated machine tools to highly flexible general purpose robots for assembly tasks.

The group has in fact existed for a couple of years informally and includes robotics researchers from four universities and a number of commercial companies.

Underpinning this development is a body of knowledge about programming assembly robots from a number of sources.

Mike Tedd of the University of Aberytwydd, a consultant to the software house SPL, explains it as

“growing interest in programming robots offline”.

As Tedd sees it, most commercially implemented robots are currently programmed by example in what is called in robotics jargon “teach mode”. The best known example of this is the paint spraying robot without which no TV program on robots is complete.

The operator performs the task which is recorded on some form of tape. The robot will repeat the task every time the tape is loaded and will go on doing so until the equipment either wears out or a new program is recorded. This recording process is viewed as a slow and laborious method of setting up a robot and leaves no room for flexibility in the process.

The move, therefore, is now towards offline programming. As Tedd explains: “In a perfect world with complex short runs the way forward is thought to be offline programming - ideally expressed in some form of language.”

The key phrase is “complex short runs”. Ultimately, the current research is aimed at producing a means of programming robots in such a way that they are able to solve problems in assembly themselves.

Animation's Puma robots, for example, offer a programming language (VAL) which goes some way in this direction but it relies upon the engineer charged with the programming having a clear idea of what is required as well having to describe how the task is to be performed.

“He knows all of the situations that may occur,” said Tedd. “But we need much higher level languages where the engineer describes the problem and lets the robot sort out how it solves it.”

“It is very hard,” he went on, “particularly when you throw in the idea of flexibility and realise that you are dealing with a world full of uncertainties.”

This takes the subject into the realms of artificial intelligence as the robot is required to perform some elementary reasoning about the problem and how it is to “solve” it.

It is no surprise, therefore, that one of the major developments in this area emanates from the University of Edinburgh's Artificial Intelligence Laboratory. A group led by Robin Popplestone has been working with SERC sponsorship for a few years now.

The language they have come up with is called RAPT (Robot Automatic Programming Tool) and is referred to by one of Popplestone's team as a “model based language”.

Pat Ambler of the AI lab explained: “It is really a development of APT - a language for numerical control/machinery.

“It has a syntax like APT which enables us to take advantage of the familiarity that engineers have with it. But there is an awful lot of mathematical reasoning behind it because assembly processes are about picking objects up and putting the a on top of others.”

“What you need to be able to say is pick up part A and attach it to part B,” she went on.

The RAPT language is currently running on the AI lab's DEC System 10 using the AI language POP 2 for its implementation. The Edinburgh group is, however, much more ambitious about future work in this area. Ambler looked into the future and suggested that the real breakthrough would come when such systems could take sense data into consideration.

“Mike Tedd commented on the advanced nature of the Edinburgh work. ‘RAPT is a leading contribution but it is a pity there are no initiatives in the UK to solve some of the more mundane problems.’

“That, presumably, is where IBM's work is mainly about.

“It all adds up to colossal value.

The best and most informative

upon the sort of support that is forthcoming from industry and SERC but there could be some breakthroughs within three years,” said Ambler.

Tedd described Edinburgh's RAPT language as the world leader in this area. But there are other efforts taking place in the US - particularly in IBM.

Although not released in Europe as yet, IBM has a robot assembly language of its own. More detail of this language and what it can do is expected to be forthcoming fairly soon and both Ambler and Tedd were excited about the upcoming meeting of the SERC working party to be held at IBM's UK research facility at Hursley.

As part of the SERC working party, IBM has an interest in both its own work and Edinburgh's.

Its language, AML (Manipulator Language) is described in a recent paper presented by David Grossman of IBM's Yorktown Heights laboratory at the Robot VI conference in Detroit at the beginning of March: “AML is both a good robot language and an excellent computer language, combining some of the best features from Algol, APL and LISP in a blend particularly suited to robot programming.”

AML was developed from earlier work by IBM which began a decade ago. According to Grossman, IBM's work on model-based systems, as opposed to teach mode systems, began in 1975.

Grossman also refers to another project in developing model-based robotics programming - EMULA which allows AML programs to be simulated offline with optional graphics display and some of the effects of sensory feedback.

IBM is extremely keen to harness the power of robots for its own internal use. Grossman outlines a number of current applications, including one for small batch assembly. It is, however,

“It is a pity there are no initiatives in the UK to solve some of the more mundane problems.”

fairly cagey about tying in research work to any future product announcements.

AML, however, is in the real world (in the US at any rate) already and is likely to form a major contribution to the future development of robot languages.

In addition to IBM there are a number of other commercial concerns involved in advancing the field of robotics, including Philips, GEC Marconi, Rolls Royce, Hall Automation and British Robotics Systems. The latter has links with SPL, which appears to be making a significant mark in the whole area of artificial intelligence. The University of Edinburgh's involvement comes from Hall, Crainfield and Cardiff as well as Edinburgh.

It is to be hoped that SERC's initiative goes beyond pure research and into the area of products.

The Edinburgh group is, however, much more ambitious about future work in this area. Ambler looked into the future and suggested that the real breakthrough would come when such systems could take sense data into consideration.

“Using a camera system we can give the robot some vision as well as being able to derive data about touch and applied forces. We are currently working on the sort of assumptions that can be made at the planning time. It depends

“on the real breakthrough will come when robots can take sense data, such as vision, into consideration.”

“That, presumably, is where IBM's work is mainly about.

“It all adds up to colossal value.

The best and most informative

The mainframe upgrade path can be seen as a delight for the corporate empire-builder, says Ivan Newman

‘Keep it costly by keeping it complex’ is IBM strategy

“What IBM now has to do is to sort out the tangle of operating systems to reduce machine overheads and cut costs to the IBM user.”

SO concluded a recent leading article in this paper. Odds are on, however, that this hope for a reduction in cost is far from the corporate mind.

However, if the choice is more bang and more buck the corporate acceptability might be much greater.

To find the evidence for this conclusion one had only to refer to a DP salary survey in the same issue.

Broadly the conclusion of the survey was that increasing DP staff storage is likely to force up wages. But the leader's subject - IBM mainframe upgrade policy, and the survey results - higher DP department manpower costs - are two different sides to the same corporate mentality. This corporate mentality comprises not only corporate strategy but also the corporate manager's executive's motives.

In short, the strategy appears to be one of keep it costly by keeping it complex and relatively incompatible. By so doing, the IBM upgrade path is strewed with the need for more capital budget, more manpower, and more administration to the probable, if veiled delight of the responsible corporate decision maker who sees his empire growing through “genuine progress”.

Hence the multitude of operating systems, terminal types, conversion requirements.

As far as the plug-compatibles are concerned, this approach weakens because it divides. Just so long as there is such a plethora of complexities, machines and architectures the plug-compatibles will be forced to divide their efforts in order to offer a broad enough range to compete.

However, too broad will result in under-investment and under-development in the product, while too narrow an offering is a gamble of large proportions. No doubt the IBM corporate watch-phrase is “keep 'em guessing”.

The plug-compatibles' increase in market share, at cost to the traditional mainframe makers, is a result of being able to fit into the broad IBM strategy of not having a compatible approach while still offering more machine for money.

In terms of the traditional mainframe competitors offering greater upgrade compatibility they have suffered reductions in market share. Why? Look again at the corporate man. The very last thing he wants to happen is for the manpower requirements to fall, or the capital budget to be underspent, or the backlog of work to fall significantly.

One result of this is that “(the executive) finds himself increasingly forced into a position where he juggles figures... to produce these results”. Perhaps the “juggling” is achieved and therefore the judgment on results in that same book, “Perhaps the most distinctive boon... and ultimate bane - conferred upon the manager - is the privilege of isolation from reality...”

One result of this is that “(the executive) finds himself increasingly forced into a position where he juggles figures... to produce these results”. Perhaps the “juggling” is achieved and therefore the judgment on results in that same book, “Perhaps the most distinctive boon... and ultimate bane - conferred upon the manager - is the privilege of isolation from reality...”

Given an equipment range offering the same or more power as equivalent IBM, obviating the need for conversions and reducing the complexity all at a lower real cost than those features, desirable though they are, may be seen as the ruination of a nice corporate empire.

Who would buy the features? Certainly not the person whose empire is threatened. That is the wrong person.

What lessons can be learnt from this? Perhaps one for IBM-watchers. Namely, do not look for necessarily logical hardware and/or software decisions in terms of the end user but rather permeate the options in a marketing sense to:

- Assist the corporate empire builder.
- Lock out traditional competitors.
- Keep the plug-compatibles guessing.
- Increase user dependence.

If that appears cynical, take heart, for every manufacturer is trying, or would like, to do the same; however everybody sees IBM doing it.

The author is a well-known man for Burroughs.



“IBM's upgrade path is strewed with the need for more capital budget, manpower and administration.”

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The highly successful Compec exhibition of computers, systems, peripherals and software is to be held in Scotland for the first time this year.

Compec Scotland in Glasgow between September 7-9, 1982 will allow companies selling into this important market to focus on computer users throughout the country.

Surveys of visitors to computer exhibitions demonstrate that users prefer to attend a show which is local to them. Compec North was enthusiastically welcomed in Manchester last year, and has expanded for the 1982 event in June.

Now Compec Scotland with a venue in the centre of Glasgow ensures a place at the heart of another key market.

For information about exhibiting at Compec Scotland contact Chris Timmins, Executive Director, IPC Exhibitions on 01-643 8040 Ext 4869. Or clip the coupon.

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PRODUCTS - 1**Round the world in 20 secs**

REFLECTING the move to even smaller electronic circuitry, the Infotec 6100, a new microprocessor-controlled digital facsimile from Kalle Infotec, can send an A4 document across town or around the world in just over 20 seconds.

The machine is a Group 3 model (with Group 2 compatibility) and is designed to keep transmission costs down to a minimum while retaining high-quality reproduction.

Although the Infotec 6100 is compact the state of the art technology enables it to transmit sharper, clearer copies of typed, handwritten, drawn or photographic material over any distance using conventional telephone lines, say the makers.

A feature of the Infotec 6100 transceiver is its ability to transmit up to 64 shades of grey. This means that photographs (both black-and-white and colour) can be faxed with very little loss of subtlety in depth of shading.

The Infotec 6100 eliminates the need for constant operator attendance with its automatic transmit and receive features.



The Infotec 6100 facsimile from Kalle Infotec.

just telephones the destination, inserts the copy to be faxed, then presses a button. Return mail can be received on the same call, so there is no need to re-dial.

The Infotec 6100 costs £7,295. Kalle Infotec (CW), 155 Gower Street, London WC1. Telephone 01-388 7271.

Functions include automatic guillotining, a reduction facility, and the automatic document feeder which allows up to 50 documents to be transmitted unattended.

In its DSE (Distributed Systems Environment) role, FDCC equipment can be deployed at many different locations, and at selected work areas within those locations, each collecting data (eg on labour reporting, quality monitoring, stock-room control, work in progress, time and attendance) which, formed into transaction files, can then be transmitted to the central computer system for processing.

According to Honeywell, the Series 3000 FDCC offers new levels of performance and cost benefits, including savings in inventory, more accurate product costing, improved information flow, reduced paperwork, increased productivity, better component control, lower downtime as a result of more efficient machine monitoring and maintenance, faster machines restart, and easier progress chasing.

A typical price for a distributed system comprising a mixed cluster of 20 terminals would be £75,000.

A standalone system comprising a small cluster of six terminals is typically priced at £38,000.

Honeywell Information Systems (CW), Honeywell House, Great West Road, Brentford, Middx. Tel: Northbourne (081) 71181.

Step forward in factory data collection

THE Series 3000 Factory Data Collection Facility (FDCC) introduced by Honeywell combines an extensive range of terminals and systems software designed to give manufacturing industry increased monitoring capability and resource control relevant to labour, materials, work in progress, finished goods inventory, and other areas of factory operations.

FDCC works as a standalone facility via the DPS 6 or Level 6 minicomputers; or it can run as part of a distributed processing system in association with Honeywell's medium and large computers or with other compatible host processors.

In its DSE (Distributed Systems Environment) role, FDCC equipment can be deployed at many different locations, and at selected work areas within those locations, each collecting data (eg on labour reporting, quality monitoring, stock-room control, work in progress, time and attendance) which, formed into transaction files, can then be transmitted to the central computer system for processing.

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The Visual 550.

Graphics terminals

THE Visual 500 and 550 range of graphics terminals providing Tektronix 4010 compatibility, 768 x 585 resolution on a 14 inch screen for less than £1,600, is now being marketed by Techem.

The 500 and 550 models are compatible with standard business, laboratory and scientific software including Plot 10, Display, Tell-a-Graph and SAS/Graph.

Techem (CW), 56 Roundways, Elliott Road, West Howe, Bournemouth, Tel: Northbourne (020 16) 71181.

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Techem (CW), 56 Roundways, Elliott Road, West Howe, Bournemouth, Tel: Northbourne (020 16) 71181.

PRODUCTS - 2**Data displayed in 16 colours on multiple screens**

DIGITAL Equipment Company's family of colour graphics products has been further enhanced. The VT36 is an intelligent display control sub-system which enables data from a PDP-11 or VAX-11 to be displayed in up to 16 colours, as graphics or graphics, on multiple display screens.

It also performs dynamic picture update, automatically displaying changes in the user's database, as they occur.

Developed as a complete package, the VT36 combines an integral 16-bit microprocessor-based controller with sophisticated graphics software. All picture display tasks are performed internally, leaving the user free to concentrate on his application.

The VT36 is designed as a totally interactive system. It is always supplied with a joystick so that the user can simply and quickly interact with the system.

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Digital Equipment Company (CW), PO Box 110, Reading RG2 0TR. Telephone: (0734) 868711.



The 1425 flat bed plotter from Benson.

Plotting is controlled directly by operator

DESIGNED with the draughtsman in mind, Benson's model 1425 flatbed plots at up to 50 cm/sec and features an 80 x 24 character screen with a 16x4 keyboard housed with the electronics in a mobile, free-standing unit.

Many plotting functions can now be controlled directly by the operator via the keyboard and screen, including individual specifications of pen speed, acceleration and pressure to ensure optimum quality of linking regardless of pen type chosen.

The screen can be used to give full prompts of all operator controlled functions and messages from the user program. A replot

function allows for exact overplotting on to a previously created drawing by digitising its size, position and orientation and precision alignment on pre-printed characters is assisted by use of a magnifying lens fitted to the pen carriage, and portable hand-held joystick control for pen movement.

The 1425 can simultaneously accommodate four different pen types for plotting on single sheets of pre-printed or plain papers, including all the media normally found in a drawing office.

Benson Electronics (CW), Techno House, Redcliffe Way, Bristol BS1 6NH.

Addition to printer series

TWO new 132-column miniature printers have been added to Mansmann's MT100 series, announced at Compec '81.

The MT130 is the simpler 100-chips version; the MT140 offers 160 chips and more options. Both are compact and low-cost. One-off retail price for the MT140 is £630.

The series is aimed at the microcomputer and the small

system. The printers are said to be quiet and easy to use.

Standard options include two-colour and OCR printing, eight character widths, programmable forms control and enhanceable paper feed.

Mansmann Tally (CW), 7

Cremyll Road, Reading RG1

8NQ. Telephone: Reading (0734) 580141 Telex: 847028.

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A POWERFUL new system that brings total data communications network control, management and trouble shooting within reach of users of smaller networks is announced by Racal-Milgo.

The CMS Series 2 is a compact complement to the large network CMS launched two years ago by Racal-Milgo. Exploiting the advanced technology of its larger counterparts, it brings the benefits of management control within the reach of networks funded by modest budgets, says Racal-Milgo.

Based on a powerful micro-computer and using advanced software, CMS Series 2 can monitor an entire data communications network from any point around the world. All management functions are performed on a dedicated second channel independent of the main data flow.

Using the CMS Series 2, the operator can detect network faults in seconds. The system instantly alerts him that something has failed, then allows him through the colour graphics display to zoom in on the fault, identify it, and reconfigure the network to restore data flow.

Printer noise is reduced, on average, by 12-15 decibels which means the machines are 75% quieter in normal office environments, say the makers.

The Power Equipment Company (CW), Richmond Court, Kingsbury Works, Kingsbury Road, London NW9 8UJ. Tel: 01-205 0038.

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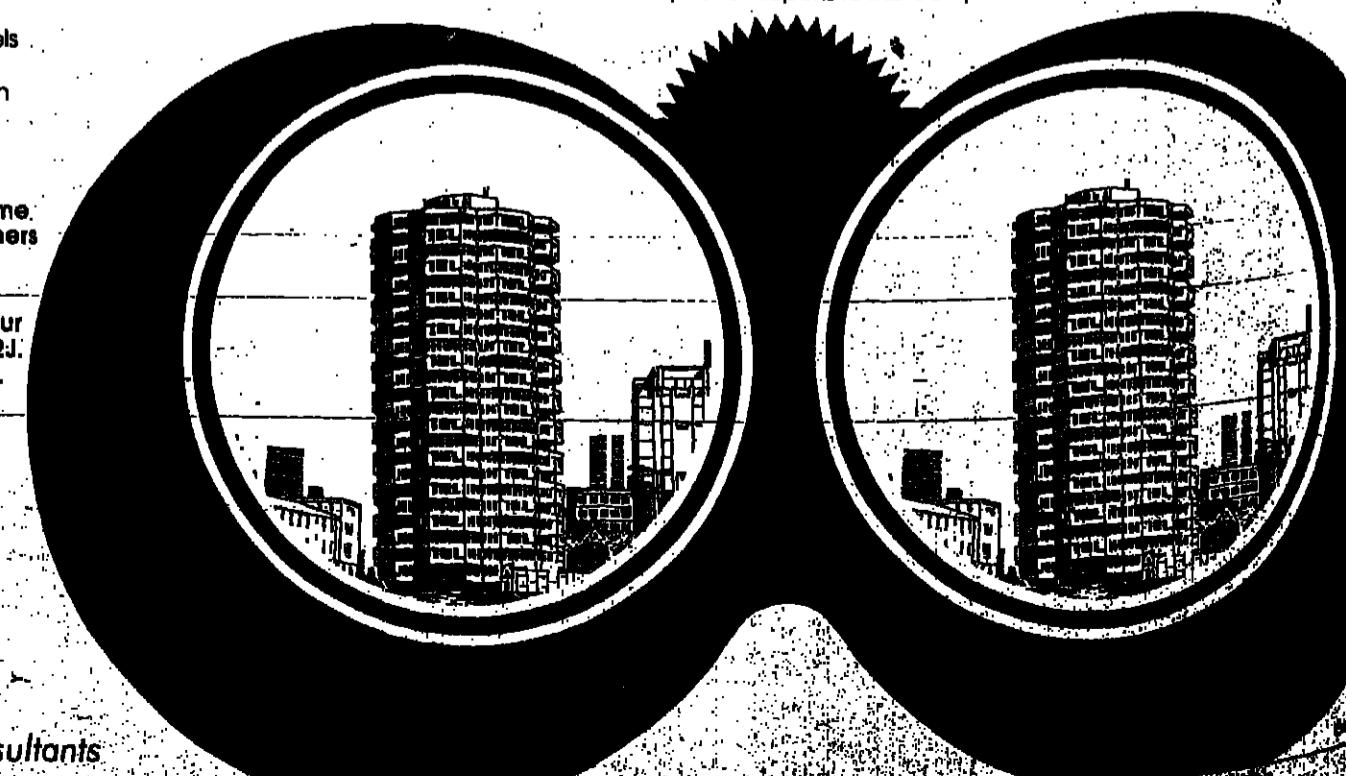
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A major designer and manufacturer of these Systems is expanding his service network and requires an Engineer to provide customer service and sales support. Experience and success in the maintenance and support of similar microprocessor products in London is important.

Programmer/Team Leader

Maidenhead £9K+
Commercial system designers

My client, a successful consultancy, requires SENIOR PROGRAMMERS with a good academic and commercial background and with experience of designing systems for mini/micro computers using COBOL and/or BASIC.

Design Engineers

Surry £8 to £12K+
Microprocessor Projects

My client is the successful designer & manufacturer of a range of micro-computers and is expanding the design team to work on the next generation of business systems.

He needs a SENIOR DESIGNER and a PROJECT LEADER with 16 bit chip family experience and the appropriate high and low level software knowledge, and a good technical background.

ADVANCE NOTICE

D. P. Programmers/Sys. Analysts
Saudi Arabia £Max Package

Big new IBM installation

An associate company has won the contract to provide the staff for a new Petrochemical complex. I will shortly be looking for suitably experienced people who want to work in the USA for a year before relocating to Saudi for a further two year renewable contract.

COBOL, CICS, IMS, OS/VSI, VM/CMS, VM/370 are all relevant.

IF YOU FEEL YOU MATCH ANY OF THE ABOVE REQUIREMENTS

please write to me, Gilbert van Someren with a CV or phone me at any time Monday to Friday for more information, on an Application Form.

Recruitment Consultants Electronics and Computing Supplies

International Business Centre

1 Mortimer Street, London W1N 7RH

Telephone: 01-537 5277

After Hours Richmond (STD 0812) 74050

ESSEX THURROCK TECHNICAL COLLEGE

Woodview, Grays

COMPUTER UNIT

LECTURER IN

COMPUTER STUDIES

required from September 1982. To teach mainly on "C" / "A" level programs and to service courses for other college departments.

Candidates should preferably be experienced teachers with a working knowledge of the BASIC language and its applications.

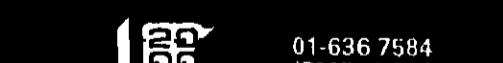
Experience of microcomputers and additional languages would be an advantage.

IMS — MTO

Urgently required for prestigious company

CONTRACT AND PERM £ EXCELLENT + BENEFITS

REF: W1286



01-636 7584

Computer User Liaison Officer

Salary scale £7,616-£9,079 inclusive

The Royal Marsden Hospital is implementing an extensive computer system to benefit both service and research.

Currently, some 30 terminals are supported, but this number is expected to increase to approximately 80, over the next two years.

The Liaison Officer is required who will provide on-going instruction and support to the users of computer terminals and aid the smooth implementation of applications such as out-patient appointments.

Training will be given to the successful applicant, who should have at least five years' experience in a hospital situation, an interest in computer systems and some experience with the use of computer terminals.

For an application form and job description, please contact the Personnel Department, Tel: 01-832 6171 ext 448. Closing date: 26th May 1982.

SALES EXECUTIVES

VIDEO TERMINALS £15,000 plus
or negotiable

INTELLIGENT TERMINALS with car

VACANCIES IN: LONDON AREA; NORTH WEST AREA

Interesting new product line including Colour graphics, DEC DG and IBM emulations.

Experienced video terminal sales executives can

expect to earn in excess of £15,000 in first year.

Guaranteed for first three months.

Please contact in confidence, BILL SMITH on 01-832 6181.

Woodgate Road, East Bierley, Colne, Essex.

01-832 6171 ext 448. Closing date: 26th May 1982.

(9668)



Electronics and Computing Supplies
International Business Centre
1 Mortimer Street, London W1N 7RH
Telephone: 01-537 5277
After Hours Richmond (STD 0812) 74050

(9668)

UNIX Systems

Monotype International is a world-wide group of companies providing a complete systems approach to the Printing and Graphic Arts Industry.

Our development group is based in Cambridge. You will be working with one of our Project Teams to design and implement innovative products for the printing industry, based around modified XENIX operating systems.

Software Engineer c£8,000

You will be able to demonstrate a professional approach to software development as well as having considerable practical experience of the C Programming Language.

Systems Engineer c£10,000

You will be able to demonstrate a record of past achievement and should have a knowledge of UNIX/XENIX kernel programming. Familiarity with PDP 11 hardware would be an advantage.

Along with the generous salary you will enjoy a benefits package which includes 25 days holiday, contributory pension scheme and assistance with relocation where appropriate.

Write or telephone:
The Technical Manager,
Monotype International,
Advanced Development Group,
Science Park, Milton Road, Cambridge.
Telephone: Cambridge 84018.

Monotype International

SCOTTISH EXAMINATION BOARD DALKEITH, MIDLOTHIAN

SYSTEMS ANALYST AND PROGRAMMER POSTS

Salary scales £9999-£210941 and
£8698-£27371 respectively

These are permanent staff posts. Systems Analyst applicants should have experience in analysing proposals, designing systems and preparing programmer specifications for Cobol and Fortran. Programmer applicants should have several years' experience of IBM Cobol and Fortran and previous operating experience would be of interest because assistance with two-shift operating will be required between March and June each year. For both posts knowledge of IBM computers, VM/CMS and JCL would be of particular advantage.

Conditions of service will be generally those of the Local Government Service. Application forms from Establishment Officer, Scottish Examination Board, Ironmills Road, Dalkeith, Midlothian EH22 1LE, (Tel 031-863 6801) to be returned by June 4, 1982.

myriad

Software Development Opportunities

Surrey/Berks Border

POSITIONS VACANT

Software Development

Good educational background plus at least three years' Assembler programming and some knowledge of communications, preferably X25/PSS, etc.

Service Engineers

also required, with a knowledge of the PDP-11 Architecture and Diagnostic Structure,

and some appreciation of Data Communications.

To discuss these opportunities in confidence and arrange an early interview, please contact Myriad at Reading. Ref: RT1/1305

Myriad Appointments Limited

30 Fleet Street, London EC4Y 1AA Telephone: 01-353 0981 24 hours

50a London Street, Reading, Berkshire RG1 4SQ Telephone: Reading (0734) 585802 24 hours

High Salaries Excellent Fringe Benefits

Various Responses Wanted

Hardware Engineers

At least 18 months' in hardware development. Knowledge of Data Communications, Telephony, Micro-processors or VLSI would be of interest.

myriad

Internal Consultancy

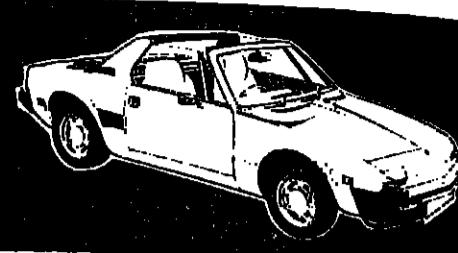
BASIC +

RSTS/E

POSITIONS

available

FIAT LANCIA



SYSTEMS PROGRAMMER HELP KEEP THE WHEELS TURNING

c £10,500

Fiat Auto (U.K.) Ltd. is one of the country's leading vehicle importers, with a wide and successful product range.

We are now at an exciting stage in our development, with opportunities for the right person to build on his or her systems programming skills in a small but lively technical support group.

Our new purpose-built Data Centre is based at Alperton in West London. We have an IBM 4341 using VM/CMS, DOS/VSE2, CICS, DL/1, VSAM, CICS/MM and Keymaster, supporting an expanding TP and RJE network. Planned enhancements include VM/SP, VM Passthru and APL.

We don't employ our systems programmers solely to install and maintain our system software - we believe in using their skills to develop additional software tools to aid our programmers, systems designers and operations staff.

CHOICE OF COMPANY CAR

If you have a good knowledge of IBM Assembler, 2 to 3 years in systems programming and experience of some or all of our software (an operations background is also a plus), then you could well be the person we need.

As a large and progressive company we offer benefits to match. These include an extremely attractive car scheme which gives you the choice of any Fiat or Lancia car in our comprehensive range.

For additional details please telephone Sue Ashby and Anne Betts on 01-863 6775 (daytime) or 0844 53531 (evenings and weekends).

Computer Personnel International
THE SPECIALIST RECRUITMENT SERVICE DIVISION OF COMPUTER SYSTEMS INTERNATIONAL
30-32 Southampton Street, London WC2. 01-836 6775



ANALYST/PROGS PROGRAMMERS

**IBM RPG III OR II
SURREY**

£8-£18,000

Our client is based in North Surrey conveniently located for applicants who live in South London or Surrey. They are an internationally known software house who currently require Consultants, Analyst Programmers and Programmers to be office based in the main but occasionally at clients' premises.

Being a software house the work involved will be varied but in the main will revolve around IBM SYSTEM 34 and SYSTEM 38 hardware, full training in RPGIII will be given to RPGII Programmers. Application areas include Manufacturing, Process Control, Accounting, Insurance and Banking.

Ideally you will have upwards of two years' experience on IBM GSD hardware and be competent within the range of your current job title. You will also be career minded. These positions offer excellent career possibilities.

Applicants should apply in the first instances to Datascene Quoting Ref M.5926.

(0834) 01-439 7871
Datascene International Limited Sceptre House 169/173 Regent Street London W1R 7FB. Telex: 25851.

24 hour answer phone
London & Brussels

datascene

UK & OVERSEAS VIA I.A.

Industrial Artists currently has a large selection of rewarding vacancies for DP professionals, both at home and abroad.

SYSTEMS ENGINEERS with microprocessor experience. Knowledge of UCSD or CP/M operating systems, with Pascal and Assembler. Data Communications experience would be an advantage.

Location: Austria and Germany Ref: 112/82

SYSTEMS PROGRAMMERS with minimum 2 years scientific, or process control, systems software design experience. Knowledge of digital techniques, communications protocols or microprocessors desired.

Location: South West England Ref: 212/82

ELECTRONICS ENGINEER also required for the above installation.

Ref: 312/82

SYSTEMS PROGRAMMER Univac 1100. Exec 8 + Data Communications.

Location: The Netherlands Ref: 412/82

SOFTWARE DESIGN ENGINEERS with minimum 3 years industrial or military software systems experience. Some hardware knowledge advantageous.

Location: U.K. and Overseas Ref: 512/82

TECHNICAL AUTHORS with experience in one or more of the following disciplines: digital techniques, microprocessors, telecommunications, message switching, quality assurance or electronics.

Location: U.K. and Overseas Ref: 612/82

We also have requirements for IBM or ICL Analysts and Programmers for a number of client projects.

Take this opportunity to discuss these and other requirements by phoning Mark Clifford or Edith Watson on (0462) 57141 (Day) or (0234) 46000 (Evenings to 9 pm) or write to:

Marketing and Recruitment Department
Industrial Artists Limited
21 Bancroft, Hitchin, Hertfordshire. SG5 1JP

IA is a registered Employment Business licensed by D of E.

EXCELLENT CONTRACTING OPPORTUNITIES

Our immediate domestic and international consulting needs are detailed below. If you are of a professional disposition, skilled and dedicated, and wish to join our growing permanent or contract staff, please contact us in respect of these and future opportunities.

INTERNATIONAL

RPG11, S34

RPG111, S38

RPG 11, S34

Strong IMS/DB skills

IBM, OS, CICS

RPG 111, S38

Programmers

Analyst/Programmers

DBA or Designer

Systems programmer

Analyst/Programmer

New York

West Africa

Holland

Paris

Brussels

Programmer/Analyst

Programmers

Team Leader, Programmers

COBOL, TSO/SPF, MVS Programmer

COBOL, IMS DB, Mark IV

COBOL, Univac 1100

COBOL, TS0/SPF, MVS Programmer

Burroughs 6800, COBOL

IBM S38 or S34, MAAPICS

TASKMASTER Experience of

Interactive systems Redifon R850

DL/1, CICS, COBOL

Analyst/Systems Designer

Analyst/Programmer

Anal

COMPUTER PROFESSIONALS FOR THE CITY

★★★ IBM Assembler/Cobol Programmers ★★★

to £9,000

Our client, a leading city bureau has asked us to carry out an extensive search for three competent Assembler Programmers, preferably with some COBOL experience, to work on twin IBM 4341 machines running under DOS/VSE. A minimum of 18 months' experience is required.

The applications areas are financial with particular reference to investment accounting systems used by insurance companies, Banks, Pension Funds, etc. Training will be given in CICS although an existing knowledge of the concepts involved is desirable. Opportunities to progress into senior positions within this large, well-established company are on merit and there is ample scope for internal promotion.

Benefits include 5 weeks' holiday, good pension scheme, twice yearly salary reviews and a challenging working environment.

For additional details please telephone SUE ASHBY and ANNE BETTS on 01-836 6775 (daytime) or 0844 53531 (evenings).

Computer Personnel International
THE SPECIALIST RECRUITMENT SERVICE DIVISION OF COMPUTER SYSTEMS INTERNATIONAL
30-32 Southampton Street, London WC2. 01-836 6775



London c.£15,000
Computer Consultancy

Stoy-MLH is an international management consultancy firm based in London, and is part of Stoy Hayward & Co., Chartered Accountants. Its assignments range the management spectrum from accountancy to marketing, from data processing to production. Computer assignments cover a wide range of business systems, with emphasis on financial and stock control systems, and on mini or micro hardware and software.

Demand for our computer consultancy services, in particular, now requires that we increase the size of our computer specialist team.

Successful candidates are likely to be in their early 30's and either qualified accountants or university graduates. They will be experienced in advising on the introduction of both software and hardware to a wide range of businesses, and able to advise from the feasibility stage through to implementation. Public speaking experience on the subject would be an advantage, as would experience of communications and networking.

Salary will be commensurate with experience and is competitive. There is a contributory pension scheme, and BUPA membership is offered to consultants and their families.

Letters of application will be treated in confidence and should be forwarded with C.V., salary progression and any other relevant information, to Mr G. Henderson, Managing Director, Stoy-MLH, 128 Baker Street, London W1M 1FH.

**STOY
MLH**

Management Consultants

UNIVERSITY COLLEGE LONDON
FACULTY OF COMPUTING SCIENCES
COMPUTER
PROGRAMMER
A/SYSTEMS ENGINEER

required for the computer group which provides the computing services for the University. Full knowledge of hardware and some software experience sufficient for maintaining the following equipment: a VME 386/256 running VMS comprising a PDP 11/34 with 70 Kbytes of disc storage, running UNIX, a terminal supporting a 32 bit processor, a PDP 11/10 running RT 11 acting as an RJE, to the ULCC computer system. Duties will include research and development in relation to the Local Area Network being developed on the Cambridge Ring.

Salary scale - £5,642 to £8,488 plus £1,036 London Weighting.

Apply in writing to Personnel Officer (Technical Staff GP1), University College London, Gower Street, London WC1E 6BT.

(9518)

INNER LONDON EDUCATION AUTHORITY
SOUTHWARK COLLEGE
THE CUT
LONDON SE1 8LE

LECTURER GRADE I
IN COMPUTER STUDIES

A Lecturer Grade I is required for this newly created post. The post holder will join a young enthusiastic team developing the teaching of computer studies throughout the college. Candidates should have a degree in an appropriate discipline or a qualification in Computing. Some industrial experience and/or a recognised teaching qualification would be an additional advantage.

Salary scale: Lecturer Grade I on an incremental scale within the range £6,034-£8,988 (plus £788 Inner London Allowance) starting point depend on qualification, training and experience.

Further details and application form from the Head of School, Adminstrative Officer (P8), 10th floor, the college (01-828 0651), returnable by May 26th, 1982.

(9448)

**BOX
NUMBERS**
Box number replies should be addressed to:
Box Number...

1/2 Computer Survey
Quentin House
The Quadrant
Button Survey RMS FAS

Local Area Network and Multifunction Workstation Software Designers

Xionics, the British local area network manufacturer widely regarded as the world's most advanced office automation supplier, needs a number of software specialists to help develop the exciting Xibus/Xinet system in the realms of voice and video communications.

Communications Software Designer
London £12,000-£20,000

This key position requires substantial real-time communications experience and involves local area network software design, real-time communications in the packet-switching environment, and resilient systems design.

Customer Support Specialists
London £12,000-£18,000

Several experienced programmers/analysts are needed to work closely with users on the design and specification of new Xibus applications, particularly in the fields of interface development and inter-system communications.

Workstation Software Designer
London £10,000-£15,000

A senior post, requiring experience of application design and implementation, together with a creative approach to user interface development.

Please write with C.V. to:

Ian Richardson, Technical Director
Xionics Ltd
Dumbarton House, 69 Oxford Street, London W1N 9LA

XIONICS

Technical Support S/W

Manchester c. £12.5K + car

Yet more expansion for this remarkably successful company creates an opportunity to join their new Manchester office. You will need several years technical software experience to include: real time, data comms, and/or data base systems, or operating systems. Starting dates are linked to internal training schedules. You cannot fail to be impressed by this client.

Contact Terry Harvey

Programmers Micros/Comms

Berks. to £11,500

Our clients are seeking programmers to join in the development of their micro based, communications orientated systems. Graduate level candidates preferred although two to three years experience in Pascal, Assembler or Fortran would be of interest as would experience with CIS-COBOL, CP/M, Unix and DEC knowledge would also be attractive.

Contact Tim Bridges

Project Manager

W. Country to £10K + car

We would like to hear from candidates with experience in the development of commercial or business systems. Ideally you will have had project control responsibility. Our client's environment is a small systems house. They will be looking for a good client relations manager. Less experienced candidates will be considered for support positions. DEC systems and Basic/DOS useful.

Contact Terry Harvey

IBM Progs. Dev/Support

Berks. to £11K + car

Our client is an International company leading the field in the supply of application packages to IBM mainframe users. Seasoned COBOL programmers are required to join the European Technical Support Team. You will work in both a development and support capacity. Very attractive working conditions and benefits are offered by this progressive worldwide company.

Contact Tim Bridges

50+ Vacancies Systems H'ses

H. Counties / Europe to £17,000+

We only work for the best companies. Our clients have many and varied projects in all parts of the U.K. and Europe. If your experience is in minis/micros with technical application or systems software you may not be realising your full potential. DEC PDP11/VAX, ARGUS 700, H.P. 3000, Intel, Motorola, Texas, DEC LSI micros, CORAL, PASCAL, RTL/2, Assemblers etc. are of most interest.

Contact Tim Bridges

Programmer Analyst

C. London to £11K

Our client is the Minicomputer Business Systems group within a large International financial organisation. An additional programmer/analyst is required to work on the development of packages for a range of equipment including PDP11, Wang 2200 and IBM 5120. Candidates must be degree level. COBOL, BASIC essential, DIBOL, very useful. Attractive company benefits.

Contact Terry Harvey

Project Manager

W. Middlesex to £13,000

The ideal candidate for this position will have a wide appreciation of micro computer applications in business and commerce with a technical knowledge of, or experience in Local Area Networking. You will be capable of designing products which integrate components in a LAN environment. You will have the skills to plan and control and will maintain technical awareness.

Contact Terry Harvey

Ass'tr Progs. IBM Sys. S/W

Berks. to £13,000

A leading International company supplying a wide range of IBM mainframe software products require IBM assembler programmers. You will be expected to work in the design, development and support of new and existing products. You must demonstrate total commitment to this type of work. Product training on in-house equipment. Some travel to USA and Europe is possible.

Contact Tim Bridges

Open letter to technical and commercial job seekers at all levels:

Write, or telephone us during office hours as below.
Any other time call Terry Harvey on: Great Missenden (0296) 4705, Tim Bridges on: The Ver (0240) 502.

We are always ready to discuss these and many other interesting positions.

HR

H.R. Associates Limited

Executive Computing and Technical Personnel Consultants
Hill House, Hill Avenue, Amersham, Bucks, HP6 5BQ. Tel: 0240 28383
1000-1800, 2000-2200. London Office: Regent Street, W1

Surrey County Council
GUILDFORD COUNTY COLLEGE OF TECHNOLOGY
(Department of Science and Electrotechnology)

PROGRAMMER REQUIRED

For the College's Computer Unit to work in a variety of Languages, but mainly COBOL and BASIC on an ICL 2804 and various microcomputers.

Salary scale £8,601-£12,875

plus £237 Surrey Allowance

Further details and application form from: The Vice Principal, Guildford County College of Technology, Stoke Park, Guildford, Surrey GU1 1EZ on receipt of SAE. (Tel: Guildford 31251.) Closing date Friday, 26th May 1982

(9470)

DURHAM CONSTABULARY

Applicants (male or female) are invited for the following civilian post

Officer Headquarters, Durham.

(Salary £9,261 to £10,276 per annum)

This is a new post responsible (along with the Computer Manager) for the analysis, development and operation of multi-user computer systems using Perseus 3200 range mini computers.

Applicants should be educated to degree standard, and have sufficient relevant experience to understand this highly responsible and demanding post.

The Authority has a scheme for the payment of removal expenses in appropriate cases.

All appointments are subject to a satisfactory medical report and to the provisions of the Local Government Superannuation Act.

Applicants should be physically fit and further particulars are available from: The Personnel Section, Tynedale Polytechnic, Borough Lane, Tynedale Polytechnic, Borough Lane, Newcastle upon Tyne NE1 8LA. Telephone: 0632 21121 Ext 4114.

Closing date for applications: Friday 20 May 1982

(9471)

**TEESSIDE POLYTECHNIC
COMPUTER CENTRE**

Teesside Polytechnic is the forefront of computing in education. The Computer Centre has a staff of 40 and operates a range of Univac mainframes, a Prime 4000 and several microprocessor systems.

PROGRAMMER ANALYST/SENIOR PROGRAMMER

To join the Applications team, responsible for supporting a wide range of languages and applications software for Polytechnic students. The post offers excellent opportunities for further development.

Salary, according to qualifications and experience: £9,025 - £12,875 pa or Senior Programmer/Analyst: £9,100 - £12,525 pa

Further details and further particulars are available from: The Personnel Section, Teesside Polytechnic, Borough Lane, Newcastle upon Tyne NE1 8LA. Telephone: 0632 21121 Ext 4114.

Closing date for applications: Friday 20 May 1982

(9472)

MANCHESTER POLYTECHNIC Computing Services Unit PROGRAMMERS

The posts entail provision of support to academic staff, and writing programs in a range of languages.

Applicants must have degree level qualifications and one year's employment as a programmer.

The posts require experience in:

(a) Business Systems: COBOL, PL/I, Pascal, Fortran, Basic, C, etc.

(b) Scientific and Scientific Applications: COBOL, PL/I, Fortran, Basic, C, etc.

(c) A new system based on a PRIME 850 with 80 terminals has just been installed. A Union Membership Agreement is in operation under which new employees are required to join a recognised union. Salary Scale: £6662 - £7137. For further details and application form, returnable by 28 May 1982, send a self-addressed envelope, marked 'S11', to:

REVEN LTD,
ROEBUCK LANE,
SALE,
MANCHESTER,
M26 0JL.

(9473)

CANADA URGENT

REVIN CANADA urgently require

Computer Programmers and Computer Analysts

Earnings £25,000 to 30,000 for one year contracts.

A minimum of 5 years exp. in Commerce or Banking is required plus IBM/Hewlett Packard experience.

For further information please telephone:

David Shea

On 081-969 3678, or send C.V. to:

REVIN LTD,
ROEBUCK LANE,
SALE,
MANCHESTER,
M26 0JL.

(9474)

It's an exciting time to join us - we are at the

front of new technology - as customers move

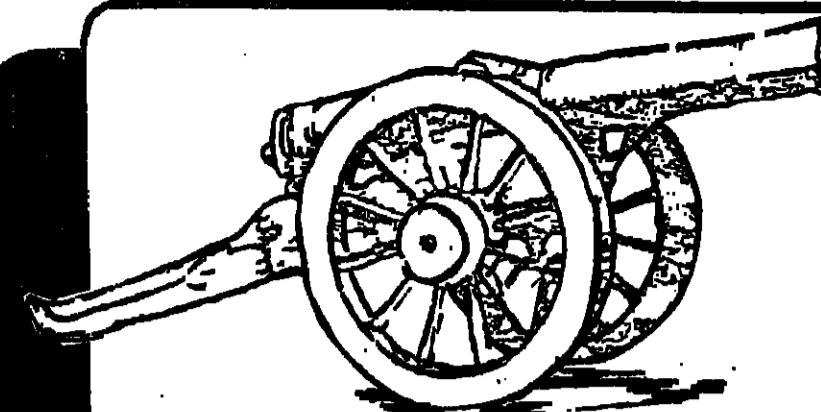
to VME 2900 and networked systems - and your

involvement will not only be in training but in the

development of courses covering new areas of

technology.

We are the first person others go to when they need a



INVEST YOUR SKILLS IN CANNON ASSURANCE

a growing organisation (1981 NEW POLICIES up 74% over 1980 — SALESFORCE more than doubled 1981) committed to the advanced use of Data Processing Technology. In return they offer:—

- ★ immediate mortgage subsidies ★ easy access (Wembley Park tube)
- ★ twice yearly salary reviews ★ excellent training facilities
- ★ free life insurance ★ non-contributory pension scheme

IBM, 4341, 3370 and
60x3270 type terminals
DOS/VSE, PL1, Shadow
IBM Assembler, C.P.G.

ANALYST/ PROGRAMMER

package to:

£9,500

Cannon is seeking a capable PL/1 Programmer who has some analysis experience ideally gained in a commercial or financial environment. With an excess of 1 year's programming and analysis experience you could join this well-established organisation. If you have worked in a Life Assurance company then so much the better. The work is mainly development and Cannon pride themselves on keeping up to date with modern technology.

Please telephone: SUE ASHBY or ANNE BETTS 01-836 6775 (daytime), 0844 53531 (evenings)

Computer Personnel International
THE SPECIALIST RECRUITMENT SERVICE DIVISION OF COMPUTER SYSTEMS INTERNATIONAL
30-32 Southampton Street, London WC2. 01-836 6775



Sales Executives

SOUTH EAST
C £17,000 + 2.0 LITRE CAR
HIGH BASIC + G'TEE

Providing truly cost effective solutions requires a unique kind of follow through.

With computer-power, inconceivable 10 years ago it has proved vital to have a marketing strategy which is sensitive to the needs of the end user and a programme of enhancement to suit their needs in the future.

The result is powerful but inherently flexible mini hardware, fully developed software and a support team both innovative and practical.

Combining these has accelerated the demand for the company's product and created opportunities for both the specialist and the generalist with either a commercial or technical/scientific background.

If you have a successful sales track record and the ability to manage and coordinate a high levels sales campaign, telephone: Steven Knowles-Baker on 01-370 2012/2013 or send a brief C.V. for his attention to the address below. Any approach will be treated in the strictest confidence.



**Michael Linford
Associates Ltd.**

Executive Search Consultants
158A Gloucester Road, London SW7. Telephone: 01-370 2012/2013.

DATABASE ADMINISTRATOR

London

An opportunity within a leading International company has arisen for a database administrator. They operate a friendly, medium-sized environment utilising an IBM 4341 running under DOS and CICS. The successful candidate, who should have a minimum of 1 year's database experience, will help to support and develop DL/1 databases in addition to VSAM & DATADICTONARY involvement. In-depth training is available where necessary, although preference is given to those with existing DL/1 experience. The company offers an excellent salary and benefits package which includes three reviews per year, free lunches and relocation expenses.

Excellent Salary
& Benefits Package
Ref: T1273

PROGRAMMERS

London Based

A rapidly-expanding software house is looking to recruit several COBOL and RPG II programmers to work in and around the London area. These are excellent opportunities for career-minded professionals who have a minimum of 18 months' experience. Successful candidates will receive in-house training, top salaries and the chance to work with the latest hardware and software.

To £10,000
Ref: T1274

ANALYST/PROGRAMMERS (SUPPORT)

Herts base — European travel

To £11,500 + car
Our client, a leading manufacturer of minicomputer and intelligent terminal equipment, requires a number of analyst/programmers to provide client support across Europe. Candidates should have solid COBOL experience and previous involvement in a computer manufacturer/software house environment.

Ref: W1297

Please, telephone for further details, or send your CV to the address below, quoting the appropriate reference number.



Computer Two Thousand Ltd.
Data Processing Consultants
217-218 Tottenham Court Road
London W1P 9AF
Tel: 01-6367584

Real Time Mini wants your experience

Particularly urgent needs at present are for Software Engineers with a minimum of 5 years' experience of radar systems, to join a London based software house but able to work in the Essex area.

Next plaintive pleas are for Software Consultants with tele-communications experience for U.K. and overseas positions. We are particularly interested in those experienced in communication protocols i.e. X25.

From programmer to consultant level we have requirements for experience in the following applications:

Industrial Control — Communications (all manner of)

Military Systems — Simulation — C.A.D. Systems — Office

Automation — etc.

Languages: High and low level.

Hardware: PDP11s — VAX — Hewlett Packard — Argus — DEC LSI

— Intel — etc.

Locations are London and the Home Counties mostly, although if you have good Real Time mini or micro experience and are seeking a new position it's more than likely we'll be able to help, being the area in which we specialise.

Almost forgot, we have a client based in Surrey who are part of an international organisation specialising in tele-communications who are desperate for hardware design engineers with experience of digital design and communications, preferably experienced with Intel equipment although any other micro experience would suffice.

Salary levels start at about £8,000 and go up to £18,000 sometimes more depending on location.

Please telephone Beryl McLaren 24 hour service on 01-836 9719 or 01-836 9882, you'll get a personal reply, not a machine.

Computer Appointments

(Recruitment Consultants)

(Real Time Mini's Place)

Suite 41/42, 12-13 Henrietta Street
London WC2



Software Engineer Surrey

The most crucial part of seeking alternative employment to your present position is, as you have no doubt experienced, finding a post which offers not only immediate interest and stimulation, but also a challenging future career path with a company which is dedicated to growth through excellence.

Our client would appear to have all the right ingredients. A small company, but part of an international organisation, they produce computer systems for power generation and allied industries.

You will work in the enviable position of a mini and micro computer environment with DEC and Intel equipment, using high and low level languages.

We would like you to be educated to degree level or equivalent, preferably in electronics or a numerate subject, although lack of academic qualifications should not deter you from applying. A minimum of 3 years' solid industrial control and/or data acquisition experience is mandatory. If you also have experience of PDP11s and RSX11 using MACRO and CORAL you will have a distinct advantage, although this is by no means essential.

The salary is from £8,000 to £10,500, allowing for an engineer with slightly less experience to apply.

For further information please contact Beryl McLaren on 01-836 9719 or 01-836 9882 any time of day, night or week-end, you'll get a personal reply (not an ansaphone).

Computer Appointments

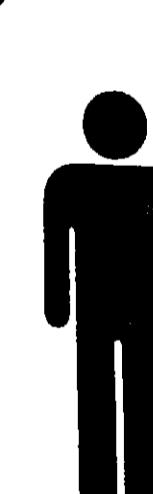
(Recruitment Consultants)

(Real Time Mini's Place)

Suite 41/42, 12-13 Henrietta Street
London WC2



June
1980



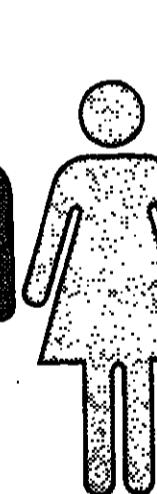
1 Contractor
NO PERMANENT STAFF

June
1981



24 Contractors
NO PERMANENT STAFF

June
1982



30 Contractors
10 PERMANENT STAFF

June
1983



30 Contractors
HOW MANY PERMANENT STAFF?

PROGRAMMERS AND PROGRAMMER/ANALYSTS

Join the Link Software House Expansion

We are a small, expanding Software House having no bias other than towards quality work with reputable clients. Our approach to staff will always be personal and friendly.

If you have a minimum of 3 years commercial IBM experience using COBOL or PL/1, ideally with Database or TP then you can be part of our expansion.

If you live within a 40-mile radius of Central London and are interested in earning up to £11,000 p.a. (reviewed six-monthly) plus benefits,

Please ring: Sheila Fox

Link Associates Limited
24a High Street, Chesham, Bucks. (0494) 784922



DALROTH computer personnel

GST COMPUTER SYSTEMS LIMITED Computer Aided Engineering Cambridge based

GST Computer Systems is looking for five staff to expand its professional services group working in the area of CAD, image processing and other CAE type applications. All positions require above average ability, a professional approach and a sense of humour. Remuneration includes a company car, profit sharing, other bonus incentives and fringe benefits.

Consultant/Project Leader

in excess of £12,500 + car

This appointment requires a solid background in the practical application of CAD systems and preferably an in depth knowledge of how these systems are built. Successful candidates are unlikely to have had less than 7 years experience and will have been involved in at least one major CAE project. The position involves feasibility studies and technical advice for clients and contributions to projects undertaken by the company. A university degree in engineering would be advantageous.

Systems Designer **in excess of £10,500 + car**

Candidates will have been involved in a major role in at least one development project for a CAD/CAE system and will have a strong Fortran background. The position involves design responsibility for projects undertaken on behalf of clients in advanced CAE application areas. Knowledge of PRIME, VAX or IBM systems would be preferred.

Programmers **in excess of £8,500 + car**

Candidates will have had at least 2 years solid experience of Fortran program development in a scientific or engineering environment. Successful candidates will work on the development of advanced CAE software on a wide variety of projects. A university degree in engineering or computer science but with more limited experience will also be considered.

Applicants should be keen to tackle advanced technology projects, accept a high level of project responsibility and be prepared to travel on business.

For further information telephone Jenny Dalrymple-Hay or Ian Murray West on 01-493 2947 (day), or respectively Beaconsfield (04946) 4579, Milton Keynes (0908) 563415 (evenings/weekends) or write quoting Ref. 9905.

DALROTH & PARTNERS LTD, 4 HALF MOON STREET, LONDON W1

DEVELOPMENT OPPORTUNITIES Central London, Software House.

A large international UK based software house is seeking experienced programmers and systems designers for a major new commercial application involving ON-LINE and DATABASES skills. You should be flexible in your approach to the hardware and software on which you work. Initially, you will work on a Banking system on large HONEYWELL hardware and will move to other systems at the end of the project.

Career opportunities are excellent for persons of a good academic background. Considerable variety of hardware and applications may be worked on in future projects. Fringe benefits are good, as one would expect in a major and well-established software house. In addition there will be opportunities for work in Europe at the end of the project.

Team Leaders c £12,000
These are senior positions of considerable responsibility in our client's organisation. You should have proven design experience in a large machine environment in addition to at least one year's supervisory work. Any Banking or Honeywell experience would be a bonus.

Systems Designers c £10,000
Working on an interesting and demanding project you should be an experienced systems designer with a background including HONEYWELL, L66/DPS. Able to carry out both systems design and program specification work for both batch and on-line programs. You should also have a solid COBOL programming background.

These opportunities truly offer considerable interest, large systems development and a very attractive and varied career.

Interested persons should telephone LEN CRAY on 01-439-8885 during office hours or talk with STEVE SYKES in our Leeds office on 0532-455911 or at home during evenings and weekends on 0532-662417.

LORIEN
COMPUTER SERVICES

Lorien Computer Services
Recruitment Consultants
OCS House, Servia Road
Leeds LS7 1NJ.
Tel: (0532) 455911

THE UNIVERSITY OF MANCHESTER
Department of Computer Science
RESEARCH FELLOW
AND
RESEARCH ASSISTANT

Applications are invited for two posts on a three year project (from 1982) to work on the design and development of a system for rigorous software development.

The environment will be built on top of powerful workstations running the UNIX system. Applications for the senior post (salary range £2,000-£2,500) will be at doctoral level or equivalent with at least five years' relevant research and/or industrial experience. For the lower post (salary range £10,500-£12,500) preference will be given to holders of a good honours degree in computing science (or relevant) and a minimum of two years' experience with formal methods. Applications, with curriculum vitae and two referees, should be sent to Professor M. J. D. Cottam, Department of Computer Science, The University, Manchester M13 9PL. Further enquiries and requests for further details are welcome. Closing date for applications: June 11th.

(8581)

Analyst/Programmer
Vacancies £10,000 p.a.
IBM Systems 38 RPG III
Call ROS EAVIS
on 01-629 9863
Business People
Recruitment Consultants
(8583)

SYSTEMS ANALYST/PROGRAMMER

BAHRAIN c£19,500pa tax-free

Cable and Wireless, the worldwide telecommunications Group, is expanding its Computer Services Department in Bahrain and requires a well-qualified Systems Analyst/Programmer to head up the Systems Development team, reporting to the Computer Services Manager. You should have at least 7 years commercial experience, including several years programming preferably in an IBM DOS environment. You should also have a proven track record of successful system design and implementation. Experience of CICS is desirable. As the team expands, you will be expected to recruit and train national staff.

We offer you a two year contract with possible renewal by mutual agreement and benefits including:

* Rent free fully furnished accommodation.

* Free Company Medical Scheme.

* End of tour leave payment and terminal gratuity included in package.

For an application form please telephone or write to: Recruitment Manager, Ref: A.988, Cable and Wireless PLC, Mercury House, Theobalds Road, London, WC1X 8RX. Tel: 01-242 4433 Ext: 4008.

Cable and Wireless
Helps the world communicate

IMMEDIATE OPENINGS

HP3000 c£350
COBOL PROGRAMMERS for Central London

IBM 4341 c£500
DOS-VS/CICS Systems Programmers for Manchester Area.

IBM SYSTEM 34 c£400
RPGII Programmer/Analysts for Kingston Area.

IBM 370 c£300-375
ROSCOE Cobol Programmers and Analysts for Bucks and Herts.

ICL2900 c£300-375
VMEB/IDMS Cobol Programmers and Analysts for Bucks and Herts.

IBM 4341 DOS-VS/CICS – Permanent Positions c£12,000

– Cobol Senior Programmer/Designers for Central London.
– Cobol Programmer for Wincle Area c£10,000

For these and other positions please contact us:

Fissions Limited
138 Alexandra Road
London SW19 7JY
Tel: 01-894 2221

GMWC

CAD – Marketing Manager
c £18,000 + car

GMW Computers is the UK's leading company specialising in CAD systems in architecture, and related engineering.

Recent successes have enabled us to grow rapidly and we are now looking for someone to develop the new role of Marketing Manager within the company reporting to the Managing Director.

As part of the senior management team we are offering an expanding opportunity covering a wide range of marketing functions including market research, product planning, promotional events such as seminars, exhibitions, etc, and liaison with our advertising agency and technical media.

The successful applicant should have a sound business background and a proven track record in a similar role.

Remuneration is expected to be c £18,000 (plus car) commensurate with experience. Berkhamsted is situated in the Chilterns with good access to London and a wide range of schools and housing.

If you would like the opportunity of joining a growing company with a progressive outlook please write giving further details to:

GMWC
THE ARCHITECTURAL COMPUTER SPECIALIST

KEY OPERATOR

He/She will be involved in the day-to-day operating of the KEINZLE 2000 and related facilities. We are able to offer a realistic salary which is reviewed annually together with Luncheon Vouchers and a pleasant working environment. We are situated almost on the doorstep of Victoria Station.

Initial enquiries to Mr. M. Patel on 01-894 1321 Ext. 48.

Interviews will be held during the week ending 21st May.

Two easy sales executives

You won't be in the usual highly competitive, "hard-sell" situation with little else to offer except price. Because what we sell is unique.

We design and manufacture a range of terminals, controllers and software systems that no-one else can match.

We're not saying it's an easy life, just a more interesting one, with new products and new projects coming up fast.

We are successful - one look at the mass of steel and concrete going up for our new Head Office at Henley-on-Thames will show you that we mean business.

If you can help get that business - and can prove it - ring David Miller or Ronnie Wilson.

It could be that the hardest thing you'll have to sell is yourself. But if you succeed, the rewards will be very worthwhile.

Telephone Roger Cleat, James Walker & Co. Ltd, Lion Works, Maybury Hill, Woking, Surrey GU2 5AN. Telephone: Woking 4001.

Videocom Limited, Newtown Estate, Henley-on-Thames, Oxfordshire, RG9 1HG Tel: 0491 78427

ANALYST/PROGRAMMER
WOKING c£9,000
HP 3000/III (Series 64 due July)

We require an additional person with on-line experience to join our team implementing a new range of Order Processing Systems, including IMAGE database and V/3000 forms handling on a Hewlett Packard HP2000.

The successful applicant must have been involved in the design of at least one major on-line system and be prepared to contribute substantially to the design and development of future systems and, therefore, be able to communicate at all levels of management and user staff.

Formal HP training will be given if necessary.

Telephone Roger Cleat, James Walker & Co. Ltd, Lion Works, Maybury Hill, Woking, Surrey GU2 5AN. Telephone: Woking 4001.

Videocom Limited, Newtown Estate, Henley-on-Thames, Oxfordshire, RG9 1HG Tel: 0491 78427

REAL-TIME SOFTWARE

BUSINESS & MILITARY INFORMATION SYSTEMS

To c£11,000 COVENTRY

Today's up-to-the-minute telecommunications industry provides a perfect illustration of the value of applied real-time computing techniques.

The linking of computers and telecommunications, in particular in the automated office and information systems environments, with worldwide investment running into the hundreds of millions.

GEC Telecommunications Ltd is in the vanguard of development in the field supplying sophisticated equipment to telecommunications authorities, business and military users across the globe.

Currently we are looking for a number of talented real-time software engineers to reinforce the teams at our Coventry headquarters, working on these interesting projects from concept to final customer acceptance.

The people we're looking for will be graduates with at least three years proven success in the development of medium or large systems using a high level language. A willingness to take responsibility is essential, since you could well find yourself leading a team.

Salaries will be negotiable in the range to c£11,000. Plus other big-company benefits.

Interested? Then complete the coupon and supply c.v. If available, to Mr. Z. J. Flizak, GEC Telecommunications Ltd, P.O. Box 63, Coventry CV3 1HJ.

Name _____

Address _____

Experience _____

Tel. No. _____

NEW 4331 INSTALLATION – D.P. MANAGER

CIRCA £15K + CAR + BENEFITS

Our Client, a major car fleet management company, which is a subsidiary of a UK Finance Group, urgently require a Data Processing Manager for their new Data Centre based in London.

This appointment presents a rare opportunity to join a major company at the outset of its DP development.

They have had an excellent growth record and as a result of their expansion, they are now creating a new DP Centre to enhance their already excellent service. Major new developments are planned based on an IBM 4331; consequently they wish to recruit an experienced DP professional for the above position.

The successful applicant will be a member of their Senior Management team. He or she must be able to demonstrate proven management skills in an IBM environment, and an understanding of all aspects of data-processing is essential.

Suitably qualified applicants should contact our recruitment advisor Michael Mannion on 01-723 4053 for an early appointment.

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26 Chilworth Street
LONDON W2 6DT 01-723 4053

Group Offices in ★ London Rome Stockholm Milan Frankfurt Zurich & Oslo

'MAY' BE FOR YOU!

SENIOR SYSTEMS ANALYST

PROGRAMMER

To £12,000

– An insurance background is not essential but is certainly an advantage to join an IBM Banking installation.

– There is a peripheral subsidy after a year is only one of the main reasons for this company. There are excellent working conditions and a very good package around is superb. Of course the work itself is extremely rewarding and will do your career no end of good.

CW19/8 TRICIA

SENIOR SYSTEMS ANALYST

To £12,000 + Perks

We have a confidential company who require

– A peripheral subsidy after a year is only one of the main reasons for this company. There are excellent working conditions and a very good package around is superb. Of course the work itself is extremely rewarding and will do your career no end of good.

CW19/8 TRICIA

BANKING SYSTEMS ANALYST

To £13,000 + Perks

A small bank based in the City with a SYSTEM 38 now

requires someone with banking experience.

– A peripheral subsidy after a year is only one of the main reasons for this company. There are excellent working conditions and a very good package around is superb. Of course the work itself is extremely rewarding and will do your career no end of good.

CW19/8 TRICIA

SYSTEMS PROGRAMMERS

To £12,000 + Perks

We have a confidential company who require

– A peripheral subsidy after a year is only one of the main reasons for this company. There are excellent working conditions and a very good package around is superb. Of course the work itself is extremely rewarding and will do your career no end of good.

CW19/8 TRICIA

CONTRACT PEOPLE WANTED NOW!

Programmer

Programmer

Programmer

Computing-Management Services

Marine Research Unit-Somerset

Our small professional Management Services Team at Templecombe, Somerset, is looking for additional specialists to help provide and maintain fast and efficient management information systems for company use. Development work includes accounting systems, administration, project control and engineering support: our business is mainly concerned with the application of electronics to naval and marine problems.

Programmer — with a minimum of 2 years in a commercial environment. Background in FILETAB, FORTRAN, ALGOL or COBOL would be an advantage, though not essential. Ref: TEM/214/P.

Computer Operator — at least one years experience on DEC equipment, for double day shift work on new VAX 11/780 and associated hardware. Ref: TEM/215/C.

In addition to highly competitive salaries, we offer big company benefits including generous help with relocation, where appropriate, to our attractive part of the West Country.

Ring Robin Churchill, Technical Recruitment Manager, on Templecombe (0963) 70551; or write to him, enclosing sufficient career details to form the basis of an interview, at Plessey Marine Research Unit, Wilkinthorpe House, Templecombe, Somerset. Please quote relevant reference number.



(8477)

Commercial Computer Systems

FIELD SALES MANAGER c£27,000 +car

Our client, a leading manufacturer of interactive commercial/business computer systems wishes to appoint a Field Sales Manager for their thriving North West region (Manchester).

Your prime responsibility will be to lead and develop a team of experienced sales executives marketing an excellent range of systems with an installed value of £20K to £300K, covering a broad spectrum of commercial applications.

To qualify you will be 26yrs to 40yrs with at least three years proven experience in a similar position with a recognised computer organisation.

Alternatively if you are selling hardware/systems, as a large/major accounts manager or a senior sales executive and would like an opportunity to move into management we may be prepared to create a manager designate position.

The importance of this position is reflected in the remuneration package of around £27K, split according to ability, experience and background and will certainly include an attractive five figure basic salary. A car and first class benefits are also included.

For further information in absolute confidence telephone:

Harry Clark on 031-228 6419 (reverse the charges) or write enclosing career details. Please quote ref: 138/74.

(8468)

ROYCE RECRUITMENT 22 WALKER STREET EDINBURGH

Computer Service Engineer SAUDI ARABIA

Saudi American Bank, an affiliate of Citibank N.A., is currently undergoing a large-scale expansion of its on-line real time data processing facilities. A computer service engineer is required to assist the existing resident engineers in the maintenance of main frame and terminal equipment.

Applicants must possess HNC, or be CDT graduates or equivalent, and have a minimum experience of one to two years. Experience with Perkin-Elmer equipment would be an advantage.

The position is based in Riyadh, but travel to installations throughout the Kingdom of Saudi Arabia will be required.

The successful candidate will be offered:

—A tax-free salary circa SR102,000 (approx. £16,500) depending on experience.

—Free furnished accommodation.

—One month's paid leave each year, with paid airfare for all family members to UK or equivalent.

—An additional one week's paid leave each year with paid airfare for all family members to Athens or equivalent.

Plus other attractive fringe benefits.

The selected candidate will be offered a 2-year contract which will be renewable.

Applications with C.V. should be addressed to: Mr. D.T. Fergus, c/o Saudi American Bank, P.O. Box 833, Riyadh, Saudi Arabia.

البنك العربي السعودي

Saudi American Bank

(8469)

DATA PROCESSING

£16,000 to £26,000 p.a. after tax

Experienced Professionals and Managers required for long-term assignment in South Africa or France (2 to 3 years)

A) D.P. PROJECT LEADERS

Good track record in management of large-scale D.P. Projects

B) PROGRAMMER/ANALYSTS

Min. 5 years' experience in Commercial Systems. Preferably in large enterprises.

C) GRAPHICS EXPERT

D) DATA BASE MANAGER

Knowledge in use of Data Dictionary for control of Data use in ownership.

Please send early replies with C.V. and tel number to:

G.E.C.I.
10 Rue Alibert Magnard
75018 Paris - France

(8466)

SENIOR SYSTEMS PROGRAMMING OPPORTUNITY IN LEEDS

The Leeds Permanent Building Society is seeking to recruit an experienced Senior Systems Programmer to join the Management Services Team at its Leeds Head Office.

The Society has a large computer centre in Leeds and terminals in more than 300 branch offices throughout the UK. The MVS operating system supports both IBM 3201 processors at the centre and plans are well advanced for major changes to the central site and on-line systems.

SENIOR SYSTEMS PROGRAMMER

A vacancy exists for a Senior Systems Programmer with several years sound experience of large IBM computer installations. A detailed understanding of MVS is particularly relevant. A knowledge of CICS, telecommunications software and data base techniques also applicable.

This is an excellent opportunity to extend technical and management expertise. The successful applicant will play a leading role in this demanding and progressive

BENEFITS

A competitive salary is offered and training will be provided on a continuing basis. A wide range of additional benefits include a staff mortgage scheme, pension, life assurance and sickness schemes, subsidised staff restaurant, and sports and social facilities.

Interested applicants should write briefly or telephone Leeds 38181, Ext. 430 for an application form.

J. Clark MBIM,
Personnel Manager,
Leeds Permanent
Building Society,
Permanent House,
The Headrow,
Leeds LS1 1NS.

Enquiries will be treated
in the strictest confidence. Envelopes
should be marked 'Staff Confidential'.

**the
Leeds
PERMANENT
BUILDING SOCIETY**

UNIVERSITY OF LONDON COMPUTER CENTRE

Communications Systems

The University of London Computer Centres provides a National Computer Service to university users throughout the country. The Centre is equipped with Control Data 7600, 8600, 6400 and Cyber 70 computers and has recently installed a 16 Mb IBM Amdahl 4700E processor. A Cray 1S processor will be installed in 1983 and can be used in a corporate location. A new Front-End system is under development to support a large network of remote batch and keyboard terminals with access to other public and private networks. The Centre has adopted the X28, Triple X, FTP and JTMP communications standards.

An exciting programme of software development is under way to support these standards under MVS, and at a later date under VMS. The Centre is also developing software to support the same high level protocols across NSC Hyperchannel equipment.

The Centre wishes to recruit an experienced systems programmer to join a team of specialists working in the Operating Systems Department at a rate equivalent to £10,000 per annum.

Candidates are expected to have several years of operating systems experience, including communications subsystems. Academic qualifications to degree level will be required.

Salary commensurate with age, relevant qualifications and experience will be in the range £6,070 to £10,876 (under review), plus £1035 London Allowance.

Further details and application forms are available from the Assistant Secretary, ULCC, 20 Gulliford Street, London WC1N 1DZ. Telephone 01-405 8400 extension 341.

Applications close three weeks from the date of this advertisement.

(8467)

SALES

£13 - £40,000

Small business systems to large mainframes

We are currently talking to experienced sales executives on behalf of 7 major household name companies. With over 30 opportunities available we need to talk to a lot more.

Ring me, Richard Gaskell, on the number below and tell me what you could offer to some of the best known names in the industry.

(8468)

EXECUTIVE FACILITIES LONDON LTD
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01-404 4055

Warrington Industrial Training Trust Limited is seeking a:

MANAGER

(£14,000 p.a. plus £1,000 car allowance)

to launch and run a:

BUSINESS PROMOTION BUREAU

This new venture is to be located in offices in the Town Centre of Warrington and is to be a separate operating Unit of the Company. It is financed by the public authorities and private enterprises. There will be a need of staff from public authorities and private enterprises.

The object of the Unit is to find, persuade and advise people to set up their own business in Warrington and also to offer every kind of business advice.

The new venture will be a separate operating Unit of the Company. It is financed by the public authorities and private enterprises. There will be a need of staff from public authorities and private enterprises.

but the success of this venture will stand or fall on the ability of the Unit to go out and attract those clients.

Relocation expenses are payable in appropriate circumstances.

Write or telephone for application form to:

CHALMERS, IMPFEY & CO.
9 Wimberleigh Street, Warrington
WA2 6JG

(8469)

ANALYSTS/PROGRAMMERS HEWLETT-PACKARD

**PETER COLLETT
AND
ASSOCIATES**

**£7-11,500
+ CAR SCHEME**

Our Client is a leading software house specialising in the marine and re-insurance field utilising Hewlett-Packard computer systems. Due to increased demand for their services they now require additional junior and senior computer professionals to work in analyst/programmer or software support roles.

The minimum requirement is 18 months commercial experience in BASIC, SPL, FORTRAN or any other block structured language, together with a good academic background. Any knowledge of Hewlett-Packard systems and software would be advantageous but not essential as training will be given where necessary. Candidates can expect a high degree of client contact and must therefore be professional in both appearance and attitude. Some travel will be required between the Company's City office and their head office based in an easily accessible part of South Buckinghamshire.

In return our Client offers an excellent starting salary and package which includes an annual bonus, flexitime, pleasant working conditions and company car scheme. If you are self motivated and looking for a challenge in a dynamically expanding environment contact Apex quoting ref. MH/04 for further details.

(8384)

Apex Apex Computer Recruitment Ltd
59 Grays Inn Road, London WC1X 8TL
01-404 4821

FIELD SERVICE ENGINEERS

London/S. Counties (Home Based)

- ★ HIGH BASIC + O/T x 8/B=5 FIGURES
- ★ PRIVATE HEALTH SCHEME
- ★ CAR CHOICE
- ★ Life Insurance
- ★ Product training US + UK

All above benefits are offered by our clients - a major American Manufacturer of double figure growth. New products in (Commercial/Scientific) - high investment programme guarantees further expansion. This continued growth means security and career opportunities in a company that grows its own Senior Staff.

If you have Computer experience and need challenge with real prospects then call Keith Wallis.

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ALLTRONICS PEOPLE

SOFTWARE ENGINEERS

Real Time/Assembler/Pascal
SENIOR PROGRAMMER
PL/I/Database/CICS

SALES EXECUTIVES
Packages/Micros/Peripherals/Turnkey
SENIOR PROJECT LEADERS
IBM/ICL, Manufacturing

PRE/POST SALES SUPPORT
Minis/Realtime/Cad/Cam
SENIOR SYSTEMS PROGRAMMERS
DOS/CICS/Teleprocessing

PROGRAMMERS/ANALYSTS
VAX/VM

FIELD SERVICE ENGINEERS
Mainframe/Minis/Peripherals

SALES & MARKETING MANAGER
Video Terminals

ANALYST PROGRAMMERS
ICL 2865/Database/Fortran/Pascal

CONSULTANTS
Banking/Insurance/Commodity Broking

SALES EXECUTIVES
Video Terminal/Cad/Cam Systems

SOFTWARE ENGINEERS
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SENIOR SYSTEMS PROGRAMMERS

PROGRAMMER COBOL

TECHNICAL AUTHORS

PROGRAMMERS
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PROGRAMMERS
Assembler/COBOL/IB

SYSTEMS ANALYSTS & PROGRAMMERS
CAD/CAM

For the opportunity to hear about YOUR kind of job throughout the U.K. telephone:

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KINGSTON-UPON-THAMES
SURREY KT2 6AA
TEL: 01-549 6256

(8464)

PROGRAMMERS! KESTREL WANT MORE

SENIOR PROGRAMMER

8-10k a.a.e.

Approximately 4 years' experience required of which

some must be of using BASIC on Mini Computers.

Berkhamsted offers a wide range of schools and housing and the

offices are close to a British Rail Station. All vacancies are open to

men and women.

If you would like the opportunity of joining a growing company

with a young up-gead outlook please write giving full personal

and career details to:

Mr. D.T. Fergus, c/o Saudi

American Bank, P.O. Box 833,

A Tale of Two Cities

UNIVAC SOFTWARE

3 yr Contract (or permanent)

to R30,000
+ benefits

CAPE TOWN and JOHANNESBURG

Our Client is seeking to recruit several key personnel with good Univac software skills to work on major projects in the exciting cities of Cape Town and Johannesburg. On offers the opportunity to work and live in this remarkable country either for a 3-year contract period or to settle permanently, according to choice and circumstance. Either way, a handsome relocation allowance will be paid, plus airfares and a wide ranging benefits package.

CAPE TOWN, draped around the slopes of Table Mountain, must surely be set in one of the world's most beautiful natural settings. Rich, fertile countryside bordered by superb beaches, and embracing a city offering a unique life style to which our client would like to invite.

A Real Time Specialist, either with a software orientated or applications development background to determine new transaction processing systems utilising TIP and DMS.

OS 1100 Specialist with an in-depth knowledge of, and skills in the installation and support of Univac OS 1100 operating systems and related software. Experience of Distributed Communications Processor, Telcon software would be an advantage.

Technical, Sales & Management Appointments



**Specialist Computer Recruitment
International Limited**

MIDLANDS & INTERNATIONAL
35-37 Great Charles Street,
Queensway, Birmingham B3 3JY
021-236 3781

HOLLAND
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1071 H.M. Amsterdam
010 3120-760947

BELGIUM

Avenue Louise 327,
Boite 4, 1050 Brussels
010 322-640 7161/71

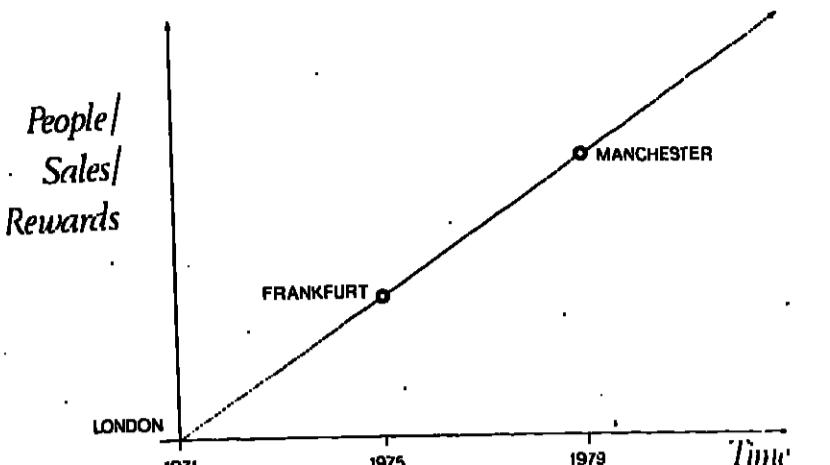
SOUTH

James House, 46 James Street,
London W1M 6HS
01-936 0671/486 0481

NORTH

Blackfriars House, The Passage,
Manchester M3 2JA
061-833 0427

DAI GROW IN PROCESS CONTROL



In 11 years DAI has grown to be a leading international consultancy and software house specialising in the expanding field of industrial application of computers. To continue this growth we need more people with at least 2 years good experience in this area. We need analyst/programmers, systems analysts and project leaders in all 3 offices.

Our growth will bring you growing rewards which include a salary up to £13,500 in UK, more in Germany, profit sharing, private medicine and much more. There will be opportunities to travel and work in different locations with our customers as well as in-house on our own systems.

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(2405-5124) or the Higher Executive Officer, ext. (2405-5124).

Application form and further particulars should be obtained from Pamela Smith, Administrator, MRC Institute of Hearing Research, University Park, Nottingham NG7 2RD. Tel: 0605 2405-5124. Completed applications should be received by May 26th.

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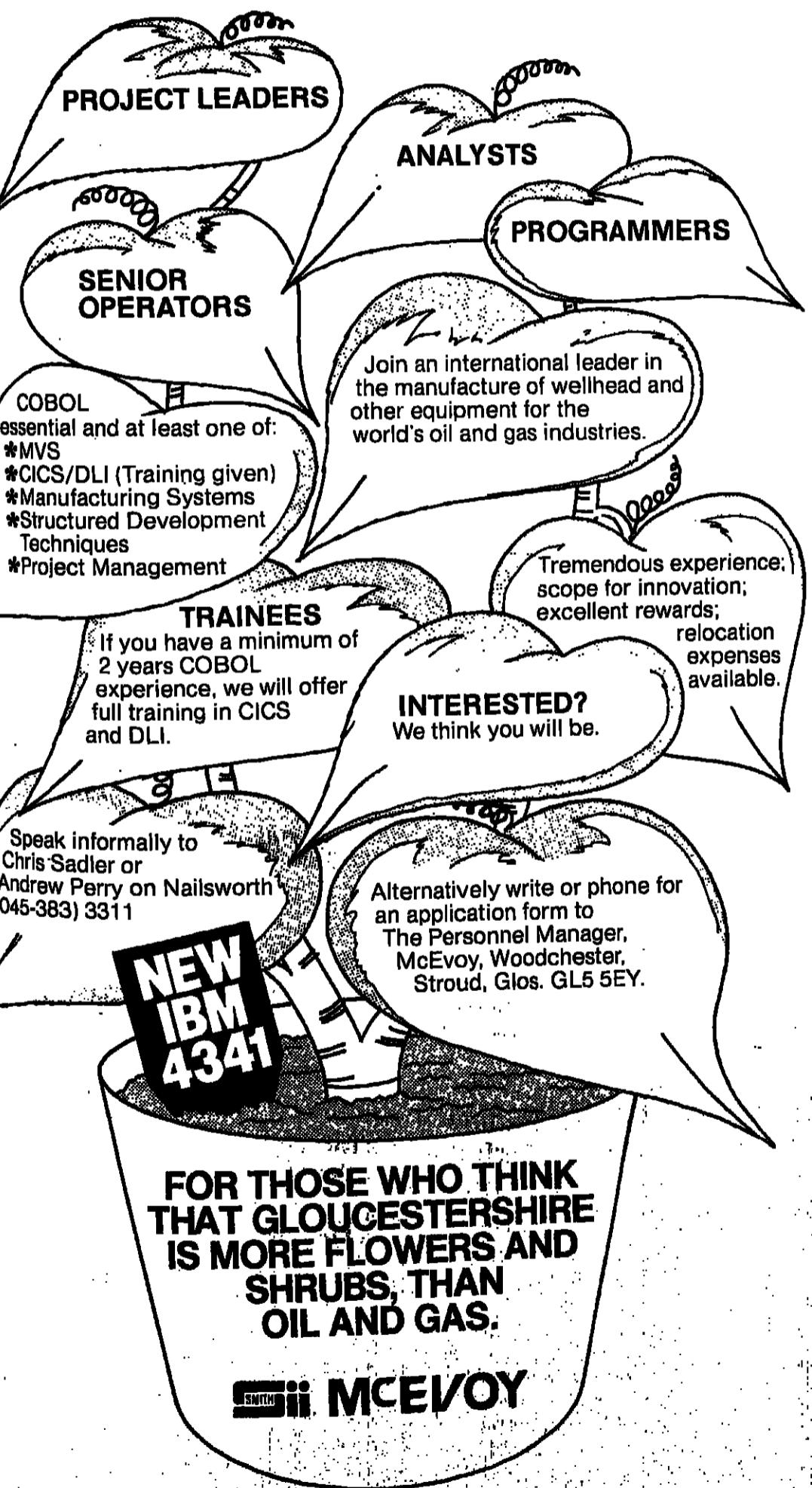
For the right applicant we offer a stimulating working environment where management will be conscious of the importance of your role, as reflected in the attractive remuneration package and other large company benefits provided. Relocation assistance will be available where necessary.

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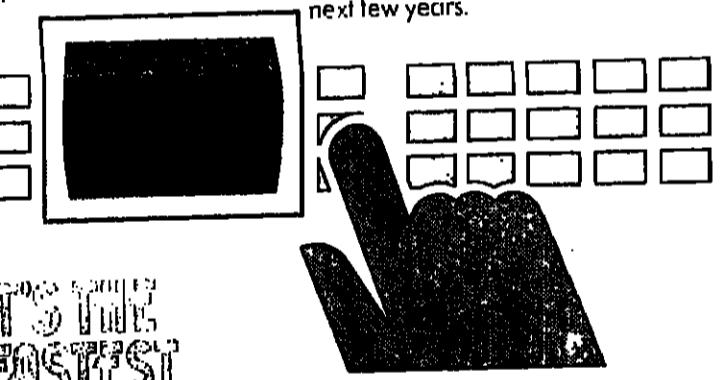


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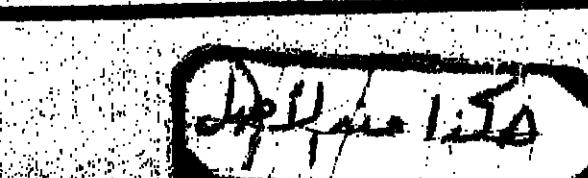
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from early feasibility to product release.

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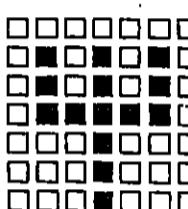
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